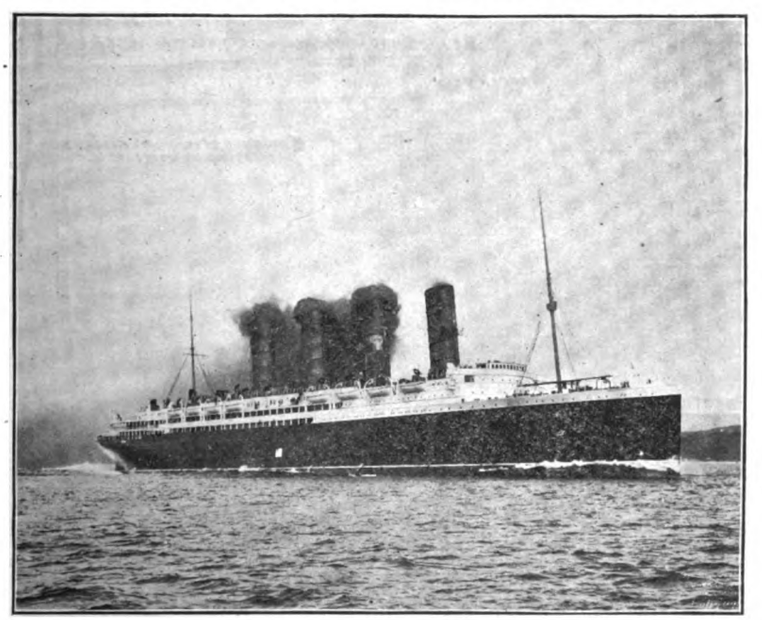
THE MARINE REVIEW

VOL. 36. CLEVELAND, SEPTEMBER 5, 1907. NEW YORK No. 10

CUNARD LINER LUSITANIA

The Cunard express liner Lusitania, the greatest steamship in the world, will sail from Liverpool for New York on Sept. 7. International interest attaches to this steamer, as she was constructed by government funds to retain the speed supremacy of the sea to Britain. She has achieved this



THE CUNARD EXPRESS STEAMER LUSITANIA.

end magnificently. On a draught of 30 ft. she has steamed over 26 knots on the measured mile. On a 48-hours' sea run on long measured distances she has maintained a mean speed of 25.4 knots. There is no doubt whatever that in ordinary practice she will exceed her guaranteed speed of 24½ knots in all weathers. The conditions of her trial were such as are to be met with in the New York-Liverpool run. For the description of the Lusitania which follows we are indebted to the Cunard Steamship Co. and to *Engineering* of London, whose description of the vessel is complete to the least detail.

THE HULL.

The constructional details of the Lusitania's hull will be readily followed by an examination of the sectional drawings. The keel is formed of three thicknesses of plates, with no outside butt-straps. Experience has shown this plan to be an advantage, because it facilitates operations in the dry-docking of the vessel. This flat keel is shown in the engraving Fig. 6. Over this, as shown in the details, Figs. 1 and 4, there is the center-line keelson. There are two corresponding longitudinal main girders, the fifth girder marked F and the margin-plate marked L on the section (Fig. 1). The dimensions of those main girders are given separately in the table of scantlings. In addition, however, there are on each side of the center-line keelson five other longitudinal girders, and the scantlings of these are given in the table.

The general construction of the double bottom is illustrated by Figs. 7 and 8, the longitudinal in the foreground being one of the intermediate members. This view further shows that, contrary to usual practice, the holes in these intermediate longitudinals for lightening the structure are placed with their larger dimension vertically instead of horizontally. This was because of the comparative closeness of the frames, but as a consequence one may walk in greater comfort through the ballast-tanks. There was no attempt to make these intermediate continuous longitudinals water-tight. The water-tight divisions of the ballast-tanks between the double bottom are made by the center keelson and the two main longitudinals F and L. This double-bottom construction extends for practically the whole length of the vessel, and, as is shown by the section, extends for a considerable part of the length of the vessel up to the lower deck. Fig. 8 illustrates the double-bottom structure aft, and affords an excellent idea of the strength of the structure at and abaft the machinery spaces.

As regards the plating, the only departure from recent practice at Clydebank is the connection of the plates of the garboard strake to the flat

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

CROSS SECTIONS SHOWING SCANTLINGS OF LUSITANIA

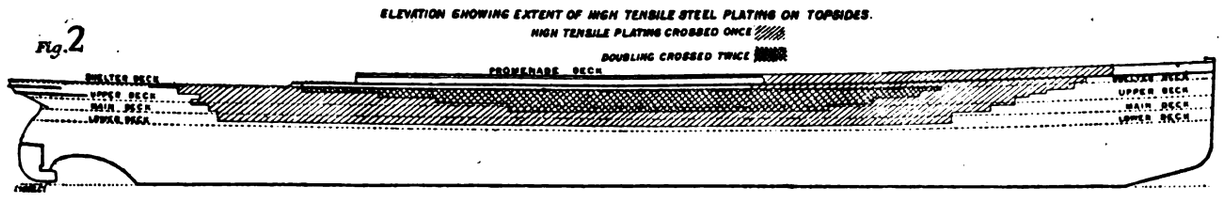


Fig. 2

Fig. 1 Q.S.S. "LUSITANIA" MIDSHIP SECTION SCALE 1/16 = 1 FOOT

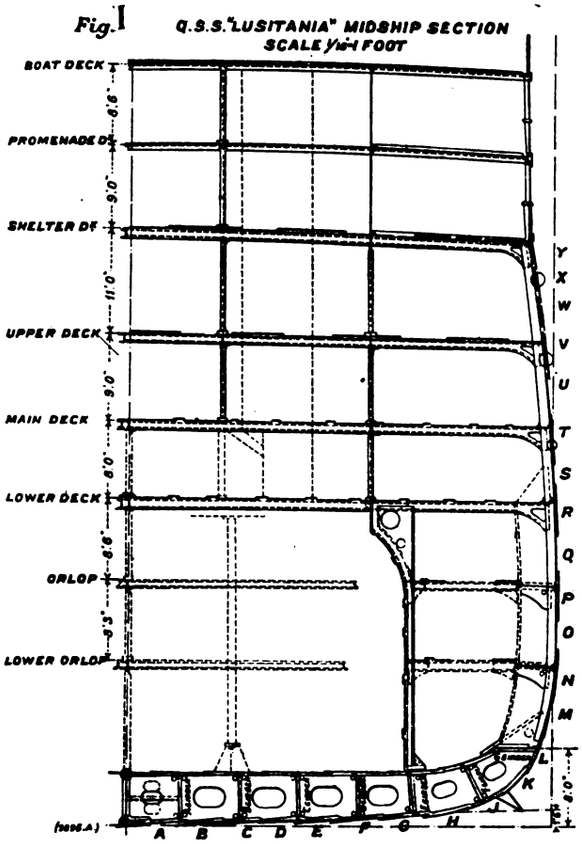


Fig 3 SECTION AT MIDSHIPS SHOWING THE STRENGTHENING OF TOPSIDES AND SHELTER DECK SCALE 1/16 = 1 FOOT

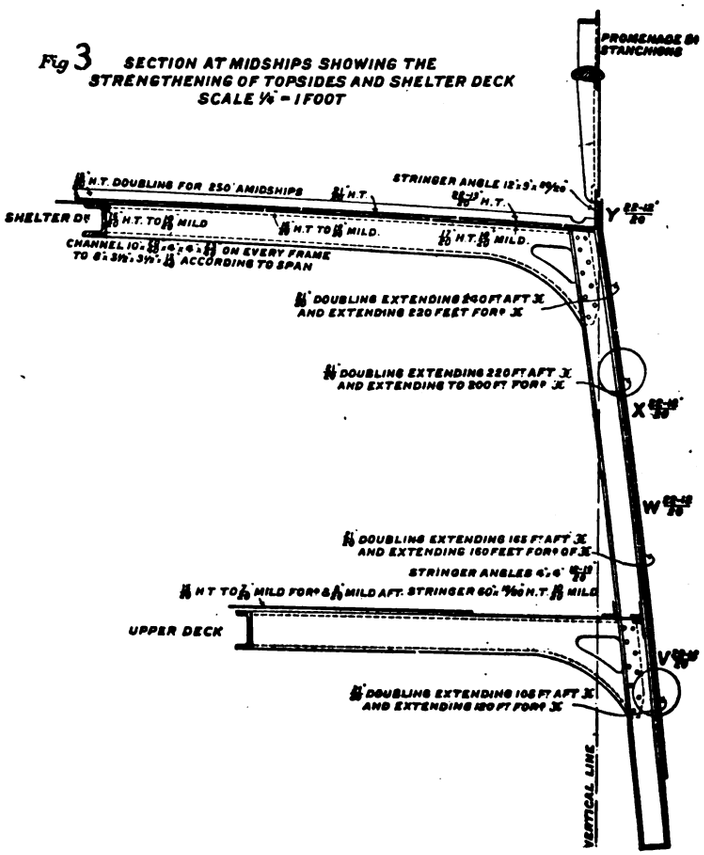

PROMENADE DK STANCHIONS
H.T. DOUBLING FOR 250 AMIDSHIPS
H.T.
STRINGER ANGLE
SHELTER DK
H.T. TO MILD
CHANNEL ON EVERY FRAME ACCORDING TO SPAN
DOUBLING EXTENDING 240 FT AFT AND EXTENDING 230 FEET FORE OF
DOUBLING EXTENDING 220 FT AFT AND EXTENDING TO 200 FT FORE OF
DOUBLING EXTENDING 185 FT AFT AND EXTENDING 150 FEET FORE OF
STRINGER ANGLES
H T TO MILD FORE & MILD AFT. STRINGER
UPPER DECK
DOUBLING EXTENDING 105 FT AFT AND EXTENDING 130 FT FORE
VERTICAL LINE

Fig 4 SECTION THROUGH KEEL & CENTRE GIRDER SCALE 1/16 = 1 FOOT

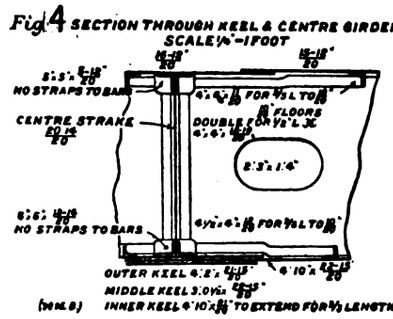


Fig 5 SECTION THRO' TURBINE SEATING

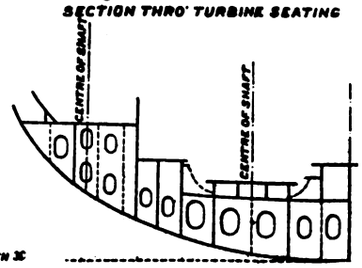


TABLE OF SCANTLINGS.

Frames.—Inside double bottom, 4½ in. by 4 in. by 12-20 in. for 3-5 L amidships to 10-20 in. joggled; and reverse frames, 4 in. by 4 in. by 11-20 in. for 3-5 L amidships to 10-20 in. joggled. Outside double-bottom channel, 10 in. by 20-40 in. by 4 in. by 4 in. by 23-40 in. for 3-5 L amidships to shelter-deck, with reverse bar 4 in. by 4 in. by 12-20 in. angle to lower orlop-deck, to 9 in. by 20-40 in. by 4 in. by 4 in. by 23-40 in. for 3-5 L amidships to shelter-deck, with reverse bar 4 in. by 4 in. by 12-20 in. angle to lower orlop-deck.

Spacing.—Frames spaced 32 in. for 3-5 L amidships to 25 in. aft and 26 in. forward.

Floors.—12-20 in. under boiler-bearers and where necessary; elsewhere, 10-20 in.

Girders.—Center, 60 in. by $\frac{20\text{—}14}{20}$ in.; G., $\frac{16\text{—}12}{20}$ in.; remainder, $\frac{12\text{—}10}{20}$ in. Center girder angles: top, 5 in. by 5 in. by $\frac{15\text{—}12}{20}$ in.; bottom, 6 in. by 6 in. by $\frac{18\text{—}14}{20}$ in.; other girder angles, 4 in. by 4 in. by $\frac{12\text{—}10}{20}$ in.; margin angle, 6 in. by 6 in. by $\frac{16\text{—}12}{20}$ in.

Inner Bottom.—Center strake, $\frac{16\text{—}12}{20}$ in.; remainder, $\frac{15\text{—}12}{20}$ in.

Orlop and Lower Orlop.—Stringer, 10-20 in.; face-plate, 6½ in. by 4½ in. by 15-20 in.; flanged girder, 9-20 in. to fore and aft bulkhead.

Lower Deck.—Stringer, 72 in. by $\frac{12\text{—}10}{20}$ in.; remainder, $\frac{8\text{—}7}{20}$ in.; beams, channel, 10 in. by 3½ in. by 3½ in. by 10-20 in. on every frame,

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

to 8 in. by 3½ in. by 3½ in. by 10-20 in., according to span.

Main Deck.—Stringer, 54 in. by $\frac{12—10}{20}$ in.; next strake, $\frac{10—7}{20}$ in. remainder, $\frac{8—7}{20}$ in.; beams, channel, 10 in. by 20-20 in. by 4 in. by 4 in. by 23-40 in. on every frame, to 8 in. by 3½ in. by 3½ in. by 10-20 in., according to span.

Upper Deck.—Stringer, 60 in. by 18-20 in. high-tensile steel to 10-20 in. mild; second strake, 15-20 in. high tensile to 7-20 in. mild forward, and 8-20 in. mild aft; third strake, 12-20 in. high tensile to 7-20 in. mild forward, and 8-20 in. mild aft; remainder, 10-20 in. Beams, channel, 10 in. by 20-40 in. by 4 in. by 4 in. by 23-40 in. every frame, to 8 in. by 3½ in. by 3½ in. by 10-20 in., according to span.

Shelter Deck.—Stringer, 17-20 in. high tensile to 10-20 in. mild, doubling $\frac{22—13}{20}$ in. high tensile; second strake, 10-20 in. mild, doubling 21-20 in. high tensile; third strake, 10-20 in. mild, doubling 16-20 in. high tensile; remainder, $\frac{10—8}{20}$ in. mild. Beams, channel, 10 in. by 20-40 in. by 4 in. by 4 in. by 23-40 in. on every frame, to 8 in. by 3½ in. by 3½ in. by 10-20 in., according to span. Stringer angle, 12 in. by 9 in. by 20-20 in.

Shell.—Outer keel, 50 in. by $\frac{21—15}{20}$ in.; middle keel; 36½ in. by $\frac{22—15}{20}$ in.; inner keel, 58 in. by 21-20 in. for 3-5 L amidships. A strake $\frac{22—15}{20}$ in.; B, C, D, E, F, G, H, J, K, L, M, N, $\frac{21—12}{20}$ in.; O, P, Q, R, S, T, U, $\frac{20—12}{20}$ in.; V, W, X, Y, $\frac{22—12}{20}$ in.; doubling to V 21-20 in. extends 105 ft. aft of amidships to 120 ft. forward of amidships; doubling to W 21-20 in. extends 165 ft. aft of amidships to 160 ft. forward of amidships; doubling to X and Y 21-20 in, for 240 ft. aft of amidships to 220 ft. forward of amidships.

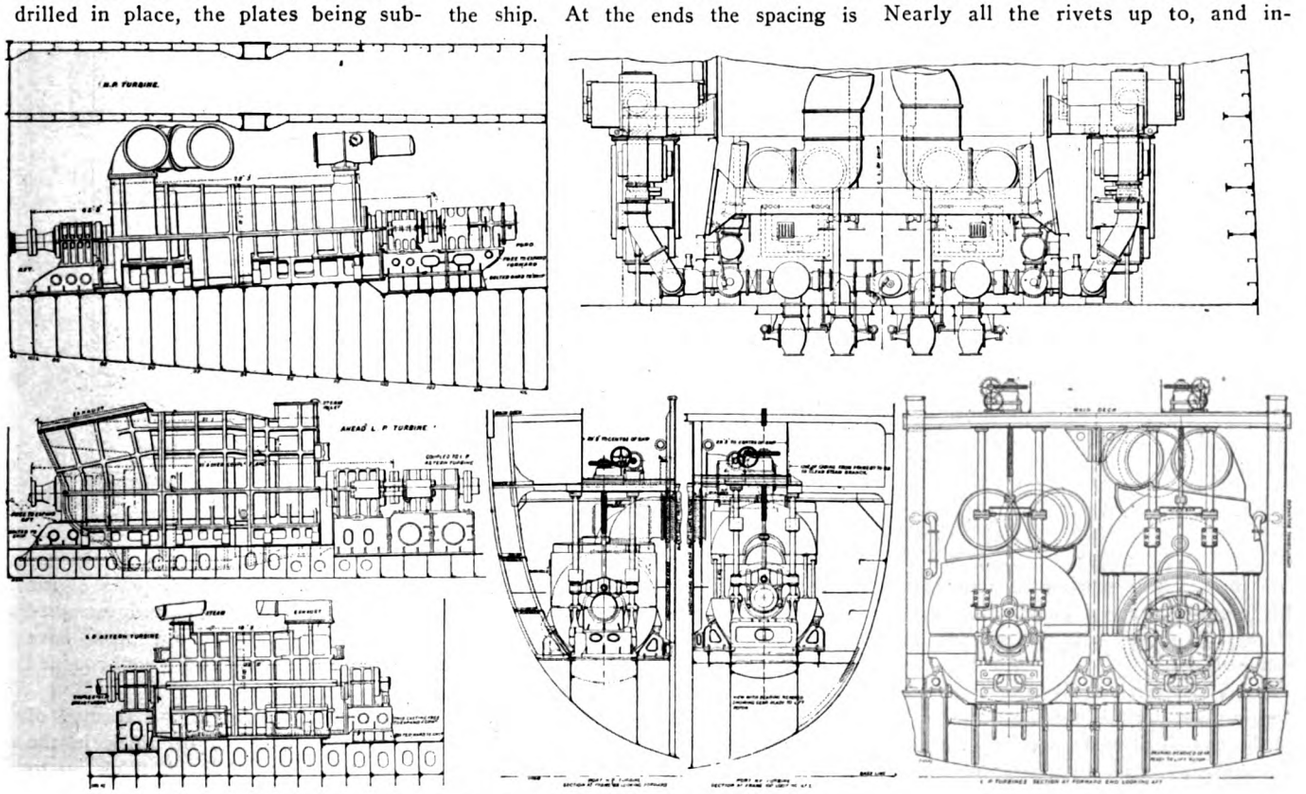
Forward, where the vessel is closed in, the plating is 12-20 in.

F. and A. Continuous Bulkhead.—9-20 in. where curved; remainder, 10-20 in.; base angle continuous, 5 in. by 5 in. by 12-20 in.

Angles.—Under decks in ways of pillars 6 in. by 5 in. by 10-20 in.

keel-plates. Mention may also be made of the longitudinal connecting angles having no butt-straps. The frames and reverse bars up to the margin plate are joggled, to avoid the necessity for slip iron. Practically all the holes in the keel-plates were drilled in place, the plates being subsequently separated so as to remove the burrs from the surfaces; the edges of the holes were slightly reamed, and the whole reassembled for riveting. The double-bottom plates, as well as most of those used in the main structure of the ship, are at least 32 ft. in length. The connecting bars of the center-line girder were riveted first, as it was found by experience necessary to get the garboards in place before any other riveting on the flat keel was proceeded with, owing to the great closing power of the hydraulic riveters used.

The floor-plates in the double bottom are placed at 32 in. centers over about 300 ft. in the central part of the ship. At the ends the spacing is 26 in. forward and 25 in. aft, the reduction in spacing being gradual. These floor-plates are 60 in. deep amidships, and have a maximum width, at the margin-plate marked L, of 48 in. The floor-plates, as shown in the midship section, Fig. 1, are in one length from the middle line to the fifth keelson, and from this to the margin they are also in one piece. This obviated inconvenience at the turn of the bilge, and proved convenient in the arrangement of the floor-plates below. The plates are generally 10-20 in. thick, except under the boiler bearers, where they are 12-20 in. The shell-plates on the outer bottom were worked clinker fashion. Nearly all the rivets up to, and including, the margin-plate were put in by hydraulic power. This necessitated the lapping of the plates, as the frames were too close together to admit of the use of riveters of moderate gap. Each strake could, therefore, be riveted right up to the edge seam, connecting to the next strake to be brought on. In this lower portion of the bottom the edge seams are double-riveted, and the butts have double



DETAILS OF TURBINES OF THE LUSITANIA.

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

straps, the outer being double and the inner treble-riveted, with openly-spaced rivets in the third row. The edges of the outer strap are slightly chamfered. From a little above the turn of the bilge the plate edges are sheared in lines approximating to the sheer of the ship, and the strakes below are worked as stealers into the edge of the lowest of the parallel strakes, thus avoiding an excessive number of narrow strakes at the bow and stern, as shown in the engravings just indicated. The framing under the turbine-seating is considerably deeper than elsewhere, and additional fore and aft girders are introduced.

As to the vertical framing from the margin-plate to the shelter deck, it is continuous. These frames are formed of channels 10 in. by 20-40 in. by 4. in. by 4 in. by 23-40 in. for 3-5 L amidships to 9 in. by 20-40 in. by 4 in. by 4 in. by 23-40 in., secured by heavy brackets to the margin-plate, and fortified by web-frames at an average of four frame-spaces apart. The shell-plating covering these vertical frames is arranged for the turn of the bilge in strakes parallel with the sheer line, worked with lapped edges and with lapped butts where they are in one thickness. The plates are generally about 33 ft. long—that is, 12 frame-spaces, plus the lap of the butt; the edges are treble-riveted, and the butts quadruple-riveted.

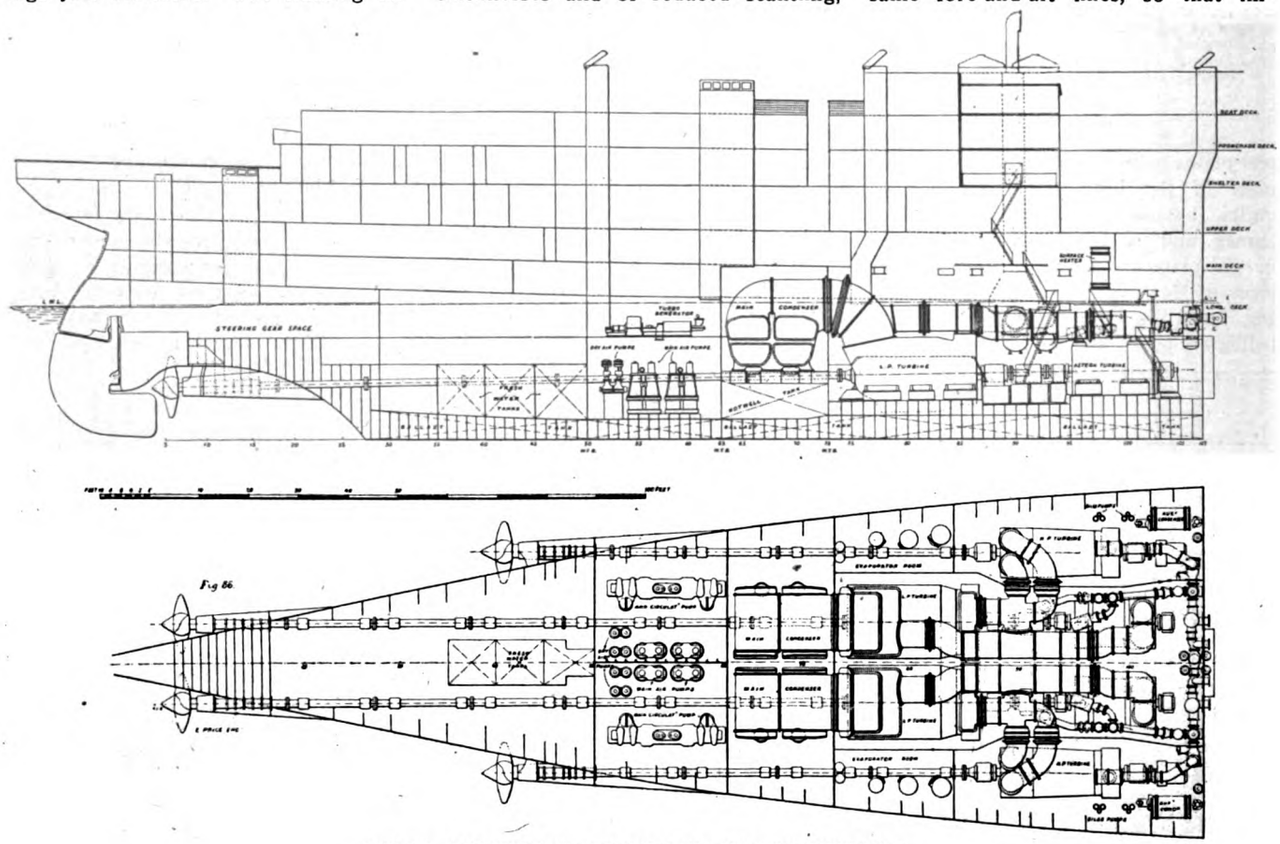
High-tensile steel was used for a considerable number of the upper as well as the sheer-strakes for a great length of the hull amidship. The extent of their use is illustrated by the diagram, Fig. 2. The lightly hatched parts are of one thickness only, and of the same scantling as would have been adopted for mild steel; the more heavily hatched portions are in two thicknesses and of reduced scantling, in consideration of the strength of the material. Throughout the region of doubled thickness hydraulic riveting was adopted. The edges are treble-riveted, and the butts of the doubled portion are strapped outside and inside at the butts of the outside plates, the outer straps taking three rows of rivets, and the inner straps taking four rows; the thickness of the straps is reduced on account of the doubling. The butts of the inside plates are strapped on the inside and quadruple-riveted.

Similar insurance against hogging stresses was extended to the upper decks, and thus a considerable portion of the shelter and a fair part of the upper deck (Fig. 3) are of high-tensile steel, and were riveted by hydraulic power. This section shows the details of the sheer-strakes, with the beams carrying the shelter and upper decks—a connection which is of considerable importance to the structural strength. The remaining deck-plating is principally of such a nature as is necessary to provide suitable floorings, and occupies only a secondary place as regards the structural strength of the vessel.

The large openings in the decks—viz., funnels and ventilators—are arranged, as far as practicable, in the same fore-and-aft lines, so that important strakes of plating are run through for long uninterrupted lengths, and these openings have heavy doublings and well-rounded corners.

The main bulkheads are formed of high-tensile steel, ½ in. thick in the lower parts, and 9-20 in. thick up to the main deck. Above this they are 6-20 in. thick, also of high-tensile steel. There are 11 main transverse bulkheads, and the sub-division is carried considerably further by the longitudinal bunker bulkheads, by the two bulkheads in the engine-room, and by the partial bulkheads in the coal-bunkers.

The midship section, Fig. 1, shows how the longitudinal bulkheads are stiffened and braced to the side. These engine-room bulkheads, being

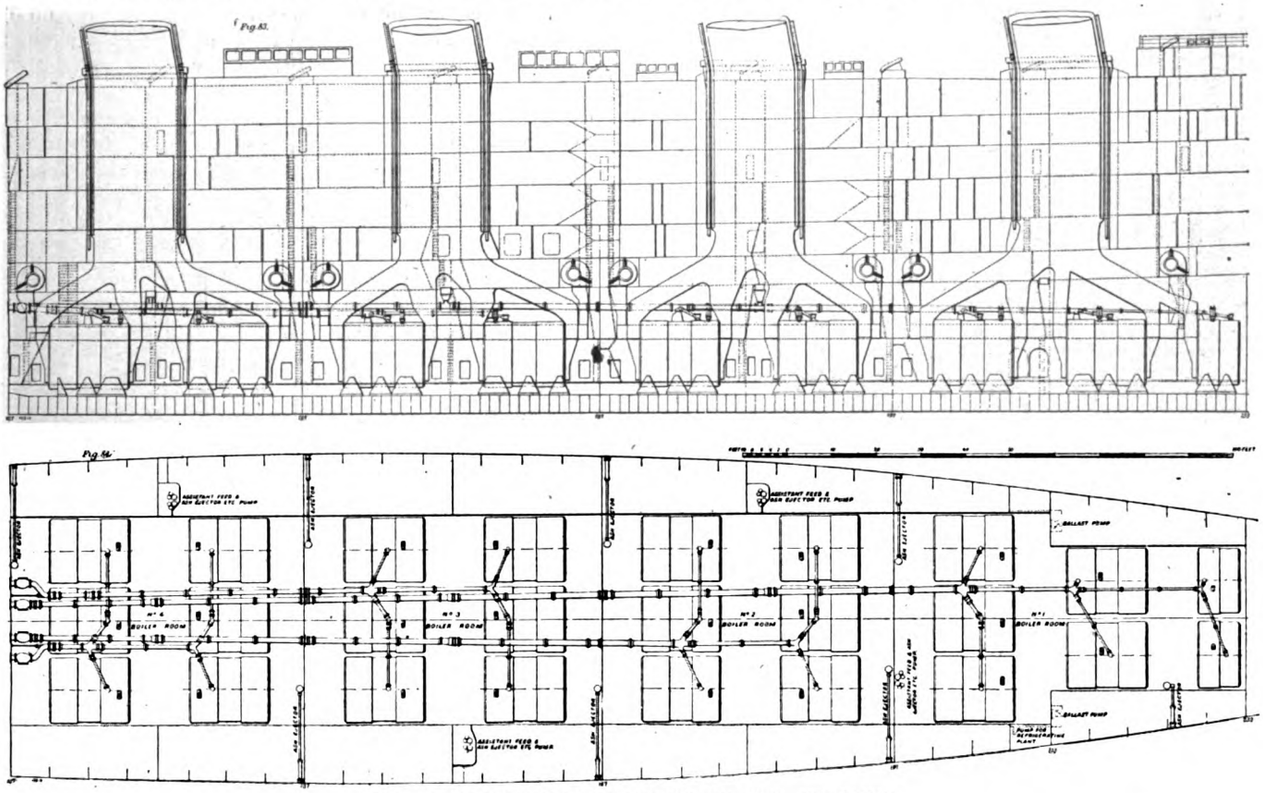


GENERAL ARRANGEMENT OF TURBINES OF THE LUSITANIA.

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

connected to the longitudinal bunker bulkheads, and of strong construction, form valuable girders, contributing to the lower deck, and flanged stiffeners above, and on the same side horizontal girders 32 in. broad, with a

The heavy section of double bottom at the stern and the bossing out of the framing for the propelling shafts



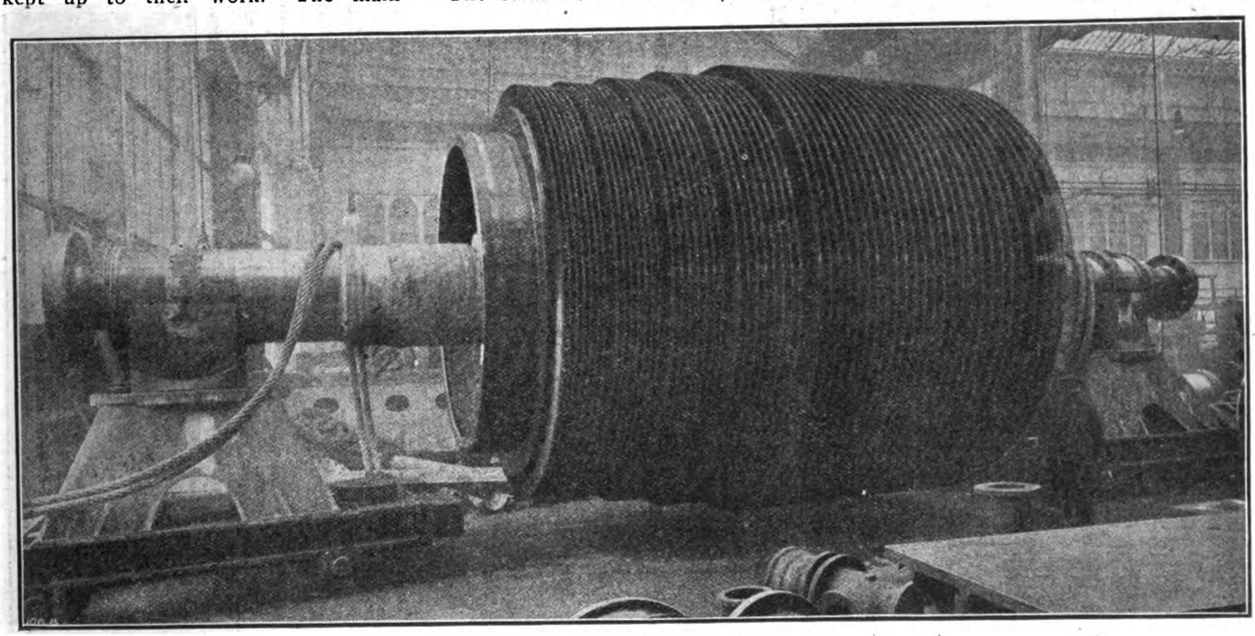
GENERAL ARRANGEMENT OF BOILERS OF THE LUSITANIA.

the strength of the ship; and, as they are well stiffened and braced, they are kept up to their work. The main

face channel 9 in. by 10-20 in. by 4 in. by 4 in. by 23-40 in.

The stem is of cast steel, and was

are of great interest. The spectacle eyes for the outer shafts are of cast steel, and well incorporated with the



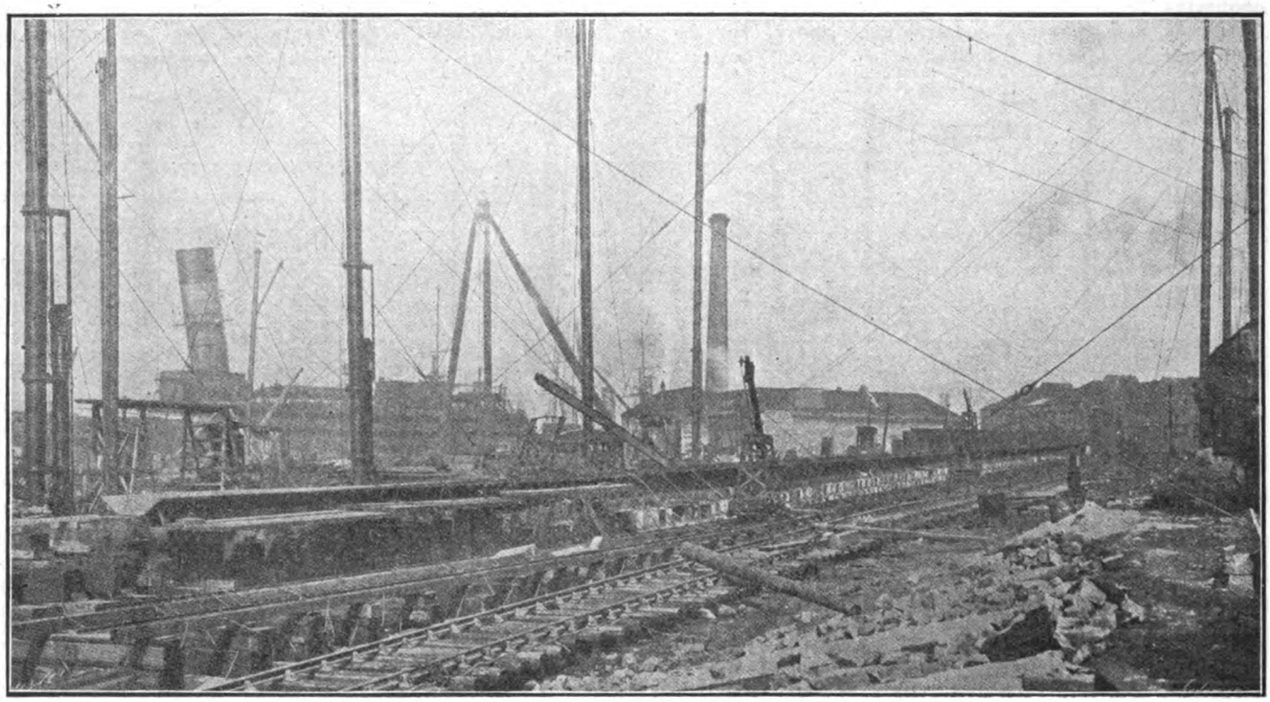
ONE OF THE LUSITANIA'S ROTORS COMPLETED.

transverse bulkheads have vertical channel stiffeners on one side, 12 in. by 3½ in. by 3½ in. by 11-20 in. to

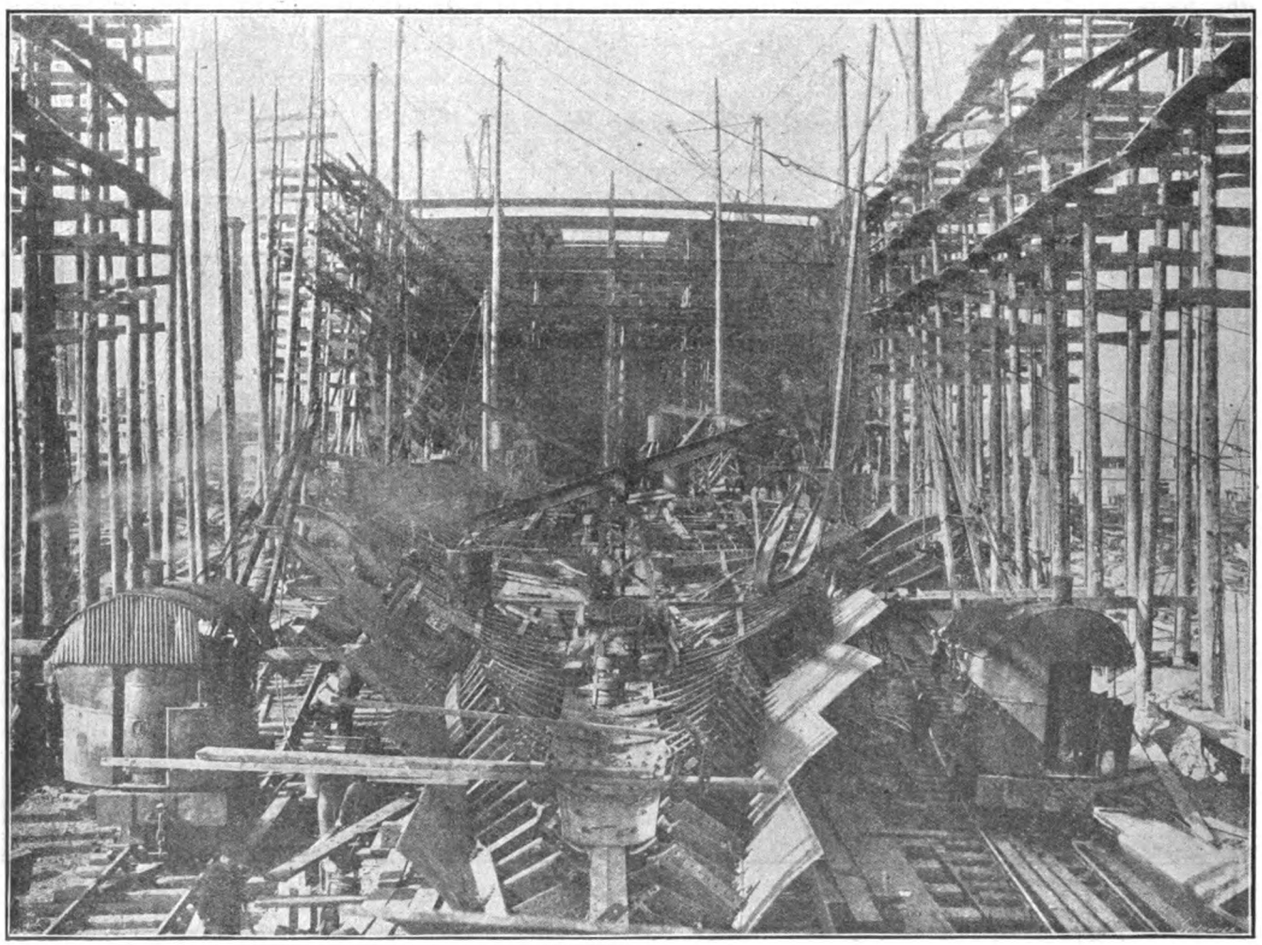
constructed with rabbets to receive the shell-plating. The weight was 8.3 tons.

framework of the hull 90 ft. before the after perpendicular. The spectacles for the two inner shafts, which

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

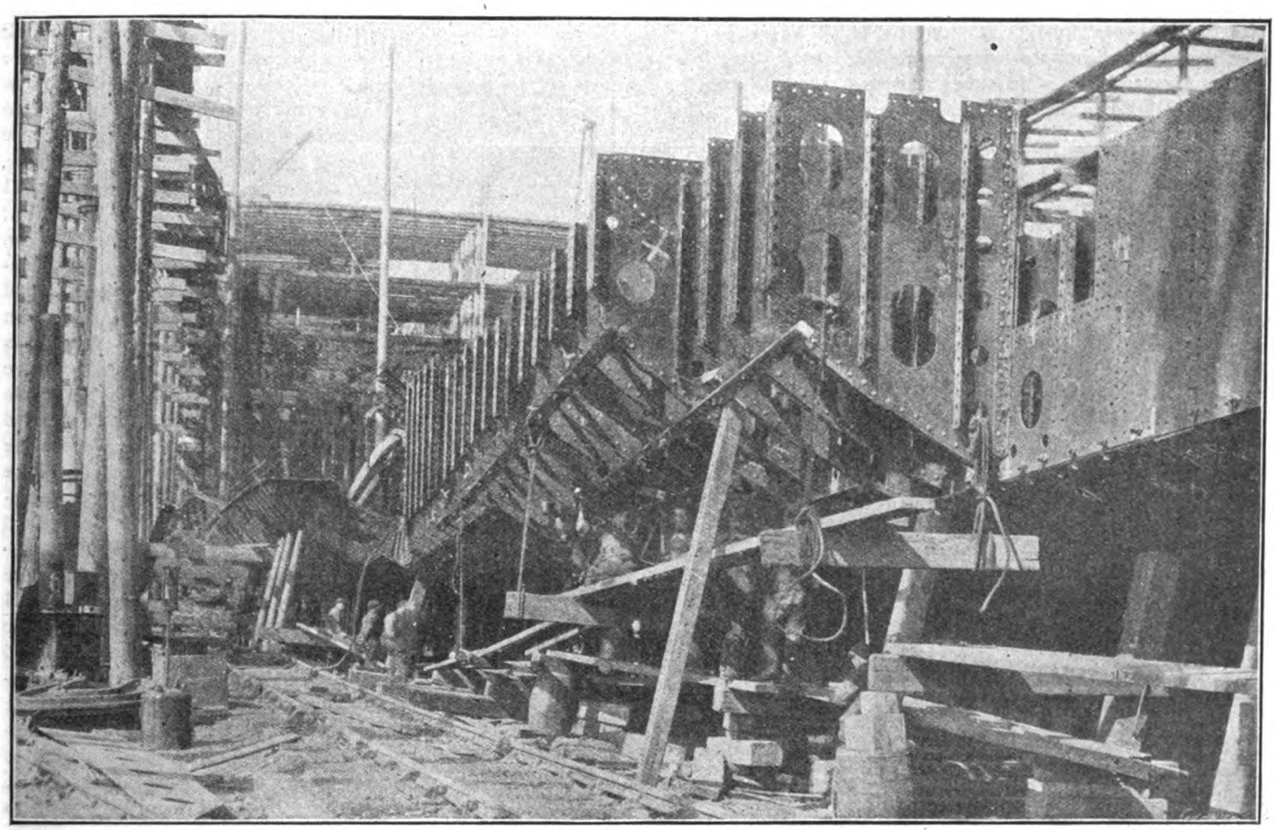


THE KEEL PLATE OF THE LUSITANIA.



DOUBLE BOTTOM AFT OF THE LUSITANIA, LOOKING FORWARD.

Generated on 2024-08-28 14:02 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



DOUBLE BOTTOM FRAMING OF THE LUSITANIA, LOOKING FORWARD.

are at 19 ft. 6 in. centers, are also of cast steel, and are riveted to the stern-post. This latter is a steel casting, of a special form, to support a balanced rudder and to take the steering-gear in duplicate. For the latter the framing and plating had to be flared out. The weight of the stern-post is 59 tons 8 cwt., exclusive of the spectacle frames, which, together, weigh 60 tons 4 cwt.

The rudder, which weighs 56 tons 8 cwt., is composed of three steel castings, and the rudder-head is of forged steel; all the parts are connected by horizontal flanges, well rabbeted and heavily bolted. The rudder area is 420 sq. ft.; there is one removable pintle.

The Lusitania was launched, weighing 15,500 tons, 14 months three weeks form the laying of the keel, notwithstanding a strike of eight weeks.

The following are the Lusitania's leading dimensions:

Length over all.....785 ft.
Breadth, extreme ..... 88 ft.
Depth from shelter deck..60 ft. 4½ in.
Depth from boat deck....77 ft. 10½ in.
Gross tonnage .....32,500 tons

THE BOILERS.

The steam-producing plant includes 23 double-ended, and two single-ended boilers, arranged in four compartments. The main propelling machinery consists of two high-pressure ahead, two low-pressure ahead, and two astern turbines of the Parsons type. Owing to the immense size of these turbines, and in order to comply with the admiralty's requirements as to subdivision, the main propelling and auxiliary machinery are located in nine different watertight compartments. In the largest and most central of these are located the two low-pressure and the two astern turbines, the whole of the feed pumps, hot well pumps, oil pumps, and the pumps for the Stone-Lloyd hydraulic system of closing bulkhead doors. In each of the two wing compartments, separated from the central compartment by a longitudinal bulkhead, are placed respectively the high-pressure turbines, the auxiliary condensers, auxiliary circulating and air pumps, also the water service, fire and bilge and fresh water pumps. Aft of these in separate wing compartments are placed the evaporating and distilling plants, underneath which runs a portion of the high-pressure tunnel shafting. In the fifth compartment, extending right across the ship, are placed the four main condensers, and underneath these the feed tank. Aft of these again are two auxiliary machinery rooms, each two-storied and each self-contained. In the lower are placed the main wet-air pumps, dry-air pumps and main centrifugal circulating pumps, and in each of the upper flats the electric generating stations, in which the power is supplied by two Parsons turbo-generators. Abaft these are the shaft tunnels. The starting gear is situated on an upper platform at the forward end of the main engine rooms and from this position practically everything can be controlled.

As stated, there are 23 double-ended and two single-ended boilers in the ship, situated in four separated watertight compartments. The forward boiler room, designated No. 1, has two single-ended and four double-ended boilers and in each of Nos. 2, 3 and 4 boiler rooms there are located six double-ended boilers, in groups of three athwart the ship. In Nos. 2, 3, and 4 boiler rooms the bunkers are situated on the sides of the boilers and boiler castings; but in No. 1 boiler-room, on account of the increasing fineness of the ship, recourse had also to be had to a large athwartship bunker, forward of which is a hold available either as a reserve bunker or for general cargo.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The double-ended boilers are 17½ ft. in diameter by 22 ft. long. In each of these boilers there are 344 stay-tubes and 720 plain tubes, the total being 1,064. The total heating surface is 6,593 sq. ft. and the grate area 168.65 sq. ft. There are separate combustion chambers to each furnace, and the water and steam spaces are exceedingly ample. The single-ended boilers differ from the others only in their length.

LUSITANIA'S SALOON SMOKE ROOM.

The furnaces have a collective grate area of 4,048 sq. ft., while the total heating surface is 158,350 sq. ft. For each group of boilers there is a separate funnel, all being of the same dimensions, as the heating and grate surfaces of each boiler-room are identical. These funnels are elliptical in form, the extreme dimensions of the outer funnel being 19 ft. by 26 ft., while the height above the grate-level is 130 ft. The shells of the boilers are made of high-tensile steel, of a maximum tensile strength of 36 tons to the square inch; but the fronts and backs, as also all rivets, including those for the shells, are made of ordinary mild steel. The 192 furnaces are of the cambered type, which is a specialty of the Atlas Works, Sheffield, of Messrs. John Brown & Co. These furnaces were made to a diameter over ribs of 4 ft. 1 9-16 in., and for a working pressure of 195 lbs. per square inch. The front and back ends of these furnaces were finished off in accordance with the latest practice, having their landings turned so as to ensure a perfect fit.

THE TURBINES.

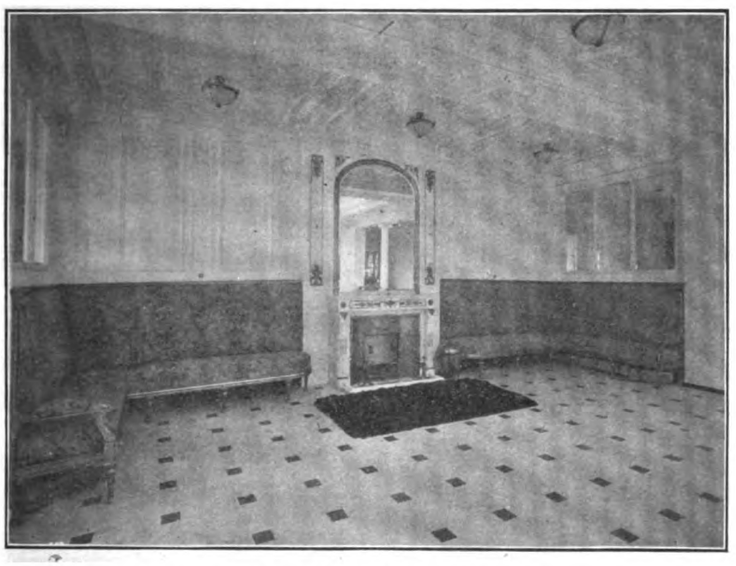
Naturally the turbines are the most interesting feature of the ship and are shown in the drawings reproduced herewith. The high-pressure turbine rotor-drums are 96 in. in diameter, the astern drums 104 in., and the low-pressure drums 140 in.

THE LOUNGE, LUSITANIA.

For such immense turbines it will naturally be inferred that the forgings, etc., required in their construction would also be of very large size. The steel forgings for the turbine-drums, rotor-spindles, and straight shafting were manufactured at Messrs. John Brown & Co.'s Atlas works, Sheffield. The turbine-drums were all hollow forged, and the low-pressure ahead drums are the largest hollow forgings that have been made up to the present time. The sizes of these drums, as delivered to Clydebank, were as follows: Outside diameter, 11 ft. 8⅜ in.; inside diameter, 11 ft. 4 in.; length, 8 ft. 2 in.; with metal 3 in. thick. To manufacture these enormous forgings necessitated a good deal of scheming and ingenuity on the part of the staff at the Atlas works. It may be of interest to give a few data of the forgings for these particular drums. The ingots used were 60 in. in diameter across the flats, and weighed 42 tons each. These were forged down to 54 in. in diameter, and an 18-in. hole trepanned through, making hollow pieces weighing about 27 tons each, which were subsequently expanded into drums 11 ft. 10½ in. outside diameter. These forgings were then rough-turned and bored in a lathe that had been specially altered for the purpose. These drums were so large that it was impossible for the railway companies to carry them, and it was necessary to take them by road from Sheffield to Manchester, where they were shipped direct to Glasgow.

The whole of the rotor-spindles and shafting were also manufactured at the Atlas works, all being, of course, hydraulically forged. The rotor-spindles are extremely large, the majority of them having coupling flanges 43 in. in diameter, and some being as large as 40 in. in diameter in the body. The

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



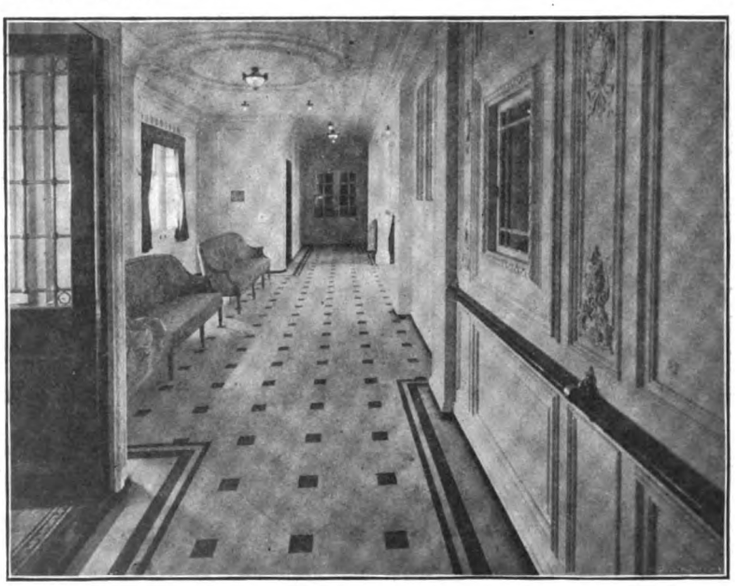
ONE OF THE ENTRANCE HALLS OF THE LUSITANIA.

intermediate shafting is 20 in. in diameter, and the tail-shafts 22⅛ in. in diameter by over 30 ft. long. The rotor-spindles, thrust-shafts, and tail-shafts are all made of high-tensile steel.

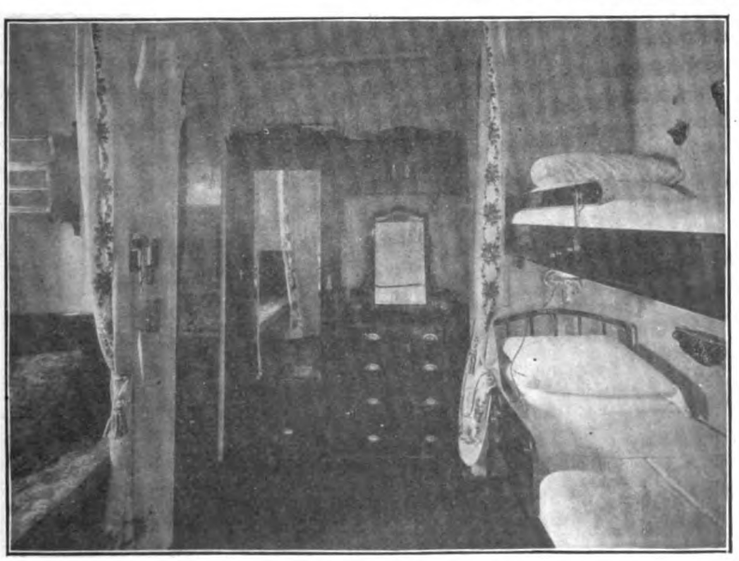
The throttle-valves, valve-covers, strainers, expansion-joints, etc., are also of very large proportions, and were made as steel castings by the Robert process, which is also one of the specialties of the Atlas works. The uniformity and superiority of the physical results obtainable by this process are particularly striking, and are attained with less difficulty than by any other method at present in use.

The cast-steel dished wheels on which these drums are shrunk were supplied by Thomas Firth & Sons, Ltd., Sheffield, who have made this particular type of turbine castings a specialty, and have supplied them to practically every firm of turbine-builders in Great Britain. The wheel illustrated was for the low-pressure turbine, and each wheel weighed 11¾ tons. In all, Messrs. Firth supplied about 440 tons of castings. The whole of the castings were subjected to tests and inspection of the board of trade and Lloyds. Owing to the great contraction that takes place in steel—double that of cast iron—the greatest possible care has to be exercised in the molding of such huge wheels to avoid possible failures, and only long foundry experience and skill can overcome the difficulties.

The turbine-blades vary from 2¼ in. to 22 in. long. In the longer blades the



ONE OF THE ENTRANCE HALLS, SHOWING ELEVATOR ON THE LEFT.



FIRST-CLASS STATEROOM OF LUSITANIA.

necessary radial and lateral stiffness is obtained by means of three rows of shrouding, in which expansion is allowed for in the same manner as in the Carmania. The longer blades of the low-pressure turbines were bound together by two circumferential strips laced with copper wire and soldered; and, in order to prevent distortion, due to the differences of expansion of the drum and the brass strip, very ingenious expansion joints had been devised. The binding strip was divided into short lengths, connected by brass tubes, in which they could slide.

THE PASSENGER ACCOMMODATION IN THE SHIP.

The passenger accommodation naturally claims attention. In this re-

Generated on 2024-08-28 14:02 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

FIRST-CLASS DINING SALOON OF THE LUSITANIA.

spect the Lusitania is without doubt the finest vessel ever built. She rivals, and in some respects excels, the most elaborate hotels of the present day. The best method of conveying some idea of the extent and beauty of the habitable quarters is to describe them in itinerary sequence, beginning at the main deck first-class entrance, which is on a low level at the ship's side, convenient for gangways from the wharves, landing-stages, or tenders.

There is here a spacious hall, 24 ft. long, and the full breadth of the ship, from which rise two electrically-worked passenger lifts, situated in the center of the stairway. These rise to a height of 44 ft. above the main deck entrance, and convey passengers to the four decks above. The stairway and hoists communicate with large landings or entrance-halls on each deck, to be referred to later. These lifts have gates and surrounding framework which have been treated with admirable taste; instead of being excrescences, they lend attraction in the decorative scheme of the stairway. The black and gold metal-work contrasts well with the prevailing whiteness of the surroundings.

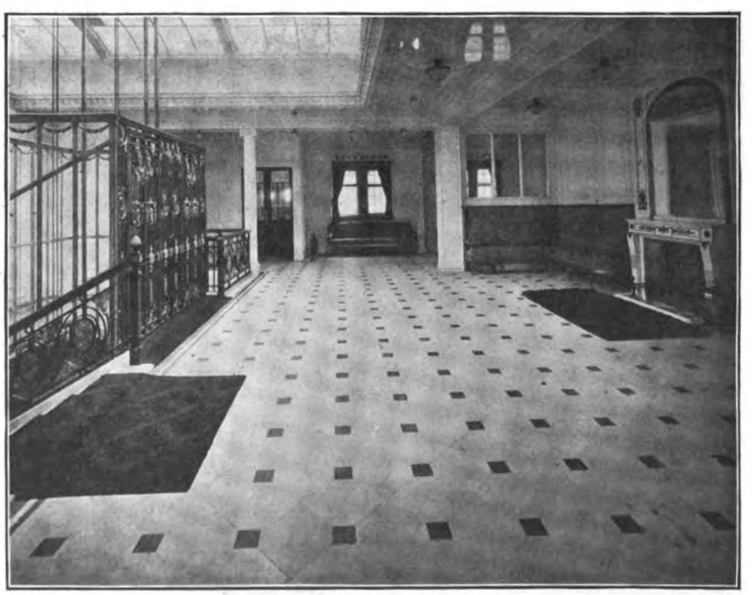
On the main deck in the vicinity of the entrance-hall is a large number of first-class cabins, suited for passengers of moderate means, or rather of a modest disposition. They are in the best part of the ship for those who desire quietude on the voyage. The rooms are furnished and decorated in simple but perfect taste.

No rooms are arranged for more than three passengers, and those for that number very limited. A feature of the cabins is their spaciousness; everything, indeed, is in keeping with the size of the vessel.

Proceeding up the main stairway, the next level, the upper deck is reached. There, extending right forward, are groups of first-class cabins; these are of unusual arrangement. The lavatory in each cabin stands in a recess, giving more floor-space. These cabins are otherwise similar to those on the main deck. The furniture, wardrobes, dressing table, corner cupboards, settees, etc., are in mahogany, and the walls of enamel white; while the drapery on the beds, the rich red curtains on the door and on the entrance to the lavatory recess, are in figured cretonne.

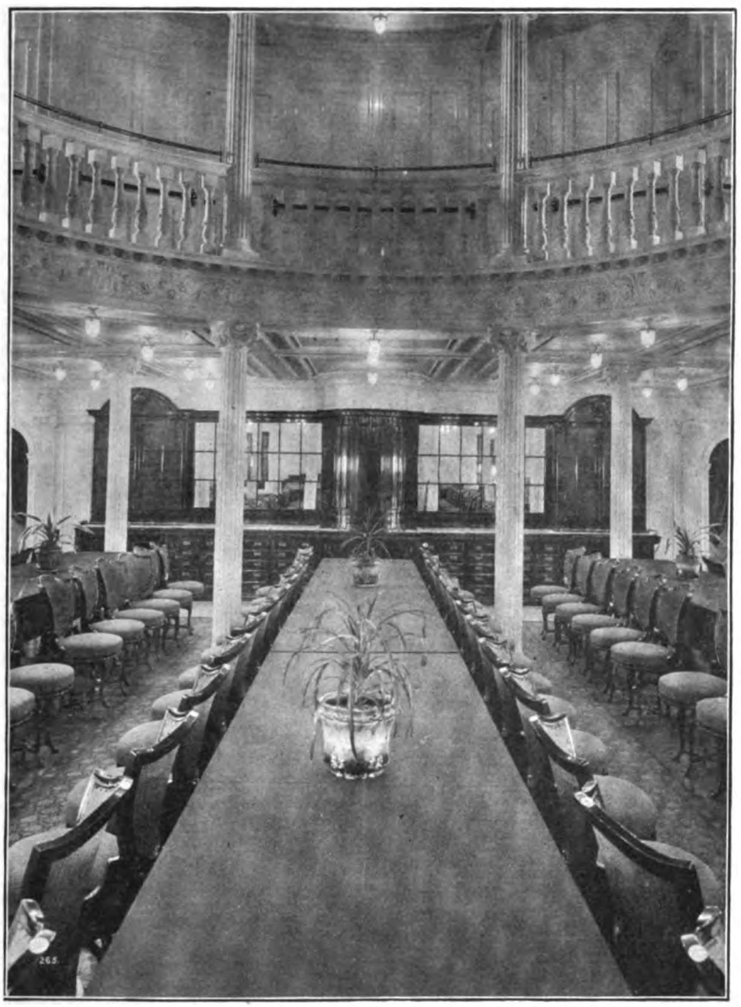
FIRST-CLASS DINING SALOON (UPPER AND SHELTER DECKS).

The first-class dining saloon is abaft the entrance hall, principally on this upper deck, but partly on the deck above and around the well and dome which forms the central decorative feature of this, probably the most magnificent saloon yet designed on a ship. The lower saloon is 86 ft. long, and the full breadth of the ship, so



ENTRANCE HALL AND ELEVATOR, LUSITANIA.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



SECOND CABIN DINING SALOON OF THE LUSITANIA.

that it is practically square. The upper saloon is 62 ft. long and 65 ft. broad. It is in the Louis XVI style; the walls being white, with gilded enrichments, in harmony with the period. At one end of the apartment is a sideboard of veneered mahogany, with panels of fine gilt bronze work. The dome, which has a height of 30 ft., is elliptical on plan, the main feature being four artistically-treated floral panels. All the carving of the walls and pillars is out of the solid wood; the dome is plaster work, of a very fine character. One cannot adequately describe what this room is like; but it is safe to say it is unsurpassed by anything in the same style. This saloon, like all the other public rooms, is all of Clydebank workmanship; the wood carving is by Mr. John Crawford, Glasgow, and the gilding by Messrs. Waring & Gillow, Ltd., London.

The staircase conforms in style to the treatment of the dining saloon, the black tones of the hoist doors and shaft forming a striking relief.

The upper dining saloon is entered from the entrance-hall on the shelter-deck. It, of course, follows the same design as the lower or main saloon. Attention is arrested and admiration aroused by the tout ensemble from this level. The artistic success of the architect is complete, because it is impossible to recognize the usual limitations in scope and execution involved in the case of a floating structure.

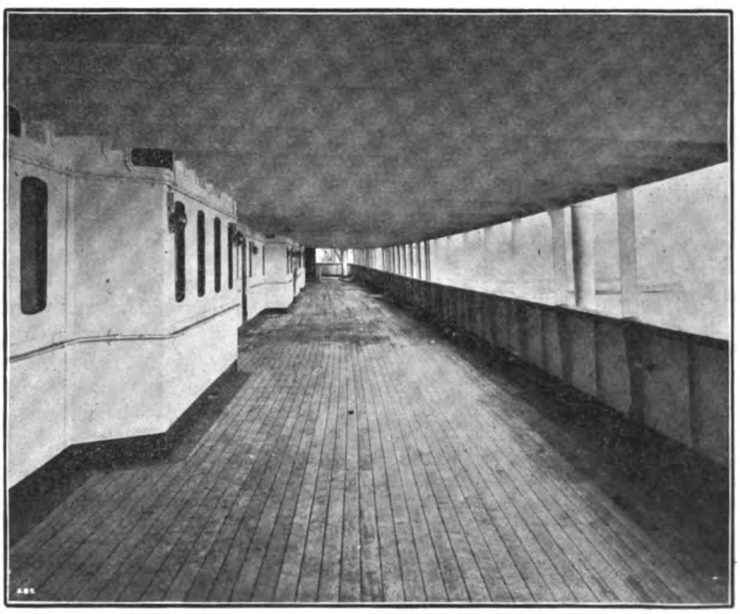
NURSERY AND CHILDREN'S DINING SALOON (SHELTER DECK).

On the shelter deck contiguous to the entrance landing, there is a nursery and dining saloon for children. The scheme of embellishment here also is in Louis XVI period, but it is advisedly simple. Both rooms are spacious—the nursery is 20 ft. by 30 ft.; and they are well adapted for the purpose, with stewardesses' rooms and pantry adjacent.

In this part of the ship are also arranged the purser's, chief steward's, and doctor's rooms, with their various offices and dispensary attached. The telephone exchange is also situated here, and next to it is the printer's shop, where, during the voyage, the daily bulletin is issued each morning, with the ship's news of the previous day and the latest Marconigrams.

THE BUREAU (PROMENADE DECK).

Continuing the tour of inspection up the main stairway, the promenade deck entrance-hall is reached. In it is the enquiry bureau, where the traveler may obtain all the necessary information to enable him to enjoy himself on board, and to plan his land journey when he disembarks. The bureau is of mahogany, and the windows are covered with brass fretwork of a chaste design. The bureau is fitted with safes, etc., where travelers may lodge their valuables during the voyage.



PROMENADE DECK OF LUSITANIA.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

SPECIAL SUITES OF ROOMS (PROMENADE DECK.)

The first-class accommodation on the promenade deck is almost entirely devoted to en-suite rooms. The regal suites, of which there are two, comprise dining room, drawing room, two bedrooms, with pantry and lavatory attached. They occupy a space 40 ft. by 24 ft. The other suites are of two rooms.

All the special rooms are representative of the styles of various well-known periods, notably English and Colonial Adam, Georgian, William and Mary, Sheraton, Louis XV, Louis XVI, and Empire, most of which by their delicacy and refinement of detail are eminently suited for the purpose of ship decoration. These styles afford many opportunities for the application of decorative effect to practical requirements, and of such opportunities the designers have made full use. Upon every part of the work there has been bestowed careful thought, from the modeled ceilings and ornamental lights to the gilt fittings of the doors and furniture. Satinwood, hardwood, mahogany, sycamore and walnut are the woods chiefly used, and they have been selected in all cases for beautiful figuring, and are enriched in many cases with fine inlays. Others of the state rooms are carried out in white enameled mahogany.

The starboard regal suite dining room is in the Louis XVI style, in paneled mahogany with mahogany inlaid furniture, and the drawing-room in the Colonial Adam style, in sycamore, with inlaid satinwood furniture. These are indeed charming examples of the period.

The regal suite on the port side is again in the Louis XVI style, and is strikingly effective, the details being based upon the beautiful examples at the Petit Trianon, Versailles. The dining room is paneled with fine Italian walnut, enriched with carved ornaments and moldings of burnished gold. The buffet writing table, dining table, and revolving chairs are also in Italian walnut and gold. The chimney-piece in this room is a particularly fine specimen of Fleur-de-Pecher marble, with marble hearth to match, and a quaint log fire, with fire-dogs complete. The paneled ceiling in white and gold, the green silk cutains, portiere, and carpet, complete a very artistic portion of the suite. A sliding glass screen separates this room from the drawing room, which is paneled in white with carved gilt moldings, enriched with beautifully-painted panels of flowers. The fine ceiling has been specially designed to meet the arrangement of electric lights; the curtains of heliotrope and cream and the green settees and carpet, a handsome mahogany commode, writing-table, etc., finish a setting quite reminiscent of Fontainebleau. The bedrooms are both designed in a sumptuous manner; one being a dream in rose-colored silk panels, with satinwood furniture inlaid with green; while the other is richly decorated in white and gold, relieved by charming Wedgewood cameos. The curtains and portieres of blue silk brocade are embellished with sprays of flowers. One cannot but feel that the whole is rightly named "the regal suite."

The remainder of the Trollope suites have been carried out in the same sumptuous manner, with every modern comfort which ingenuity can suggest, each room being provided with telephones, electric lights, radiators, etc. The styles adopted are Empire, Georgian, Queen Anne, Sheraton and Louis XVI, and each has been treated with a purity of style and color which denotes the true artist.

At the extreme fore-end of this shelter deck-house is an observation room, where the passengers (when the elements are against outside promenading) may have a glimpse of the vessel's head as she plows her way across the ocean.

On this same deck are arranged a large number of special rooms. These rooms represent those developments of the later Renaissance which experience and taste have shown to be most congenial to the complex requirements of modern life. The styles selected are the Louis XV and Louis XVI, the English, Georgian, and the simpler treatments of the later eighteenth century known as Colonial. The determining character of these apartments is a refined simplicity of treatment. Molding of delicate contour, restrain in the carved parts and quiet harmonies in the color scheme, are the points which will attract the attention earliest. The more detailed examination of each scheme will reveal that, while the essential charm of each style has been preserved, none of the requirements so needful to comfort in ship life have been sacrificed to decorative effect.

Coming next to the last stage of the first-class accommodation, namely, the boat deck, it may be noted first that the top flight of the stairway is elegantly decorated, plentifully supplied with lounge-seats and chairs, all in keeping with the surroundings. There is a handsome marble fireplace, and the prevailing tones of white and gold blend well with the marble adopted. The upholstery is a delicate figured rose-shade tapestry.

THE WRITING-ROOM AND LIBRARY (BOAT DECK).

From this hall entrance is obtained at the fore-end to the writing room and library, which is 44 ft. by 52 ft. This apartment is decorated in the refined style practiced by the Brothers Adam in the latter part of the eighteenth century, and is, although very quiet, a charming saloon, replete with every convenience. The walls are cleverly spaced out with beautifully carved pilasters and moldings, with panels in delicate gray and cream silk brocade. The windows, glazed with specially etched and other glass, have pretty embroidered valances and curtains of Rose du Barri silk tabouret, which is quite unique, being copied from an old document of the period found at Milton Abbey. The carpet has been specially woven for this room in rose color, to harmonize with the surroundings. The furniture is in inlaid mahogany, the settees, easy chairs, and writing-chairs being upholstered with the same materials as the curtains. The writing-tables are particularly handsome, each having in the center a finely chased and mercury gilt lamp. The ceiling—leaded glass and electric fittings—complete a scheme which is most pleasing, and will undoubtedly be looked upon as one of the finest, if not the finest, apartment on the vessel. The furniture is by Messrs. Trollope.

Forward of the writing-room are arranged a large number of special rooms, decorated and furnished by the various firms already mentioned. It may here be mentioned that there are in all 87 special cabins fitted throughout the ship.

THE FIRST-CLASS LOUNGE (BOAT DECK).

Abaft the entrance hall is the first-class lounge, which is 68 ft. by 52 ft. This apartment has been treated in a light Georgian style, the mahogany paneling being veneered and inlaid in specially-selected and uniquely-figured woods, combining solidity of work with artistic treatment. The furniture, of mahogany and satinwood, with inlaid tables, has been arranged in groups for social intercourse. Comfort and durability have been aimed at, as is evidenced by the double-stuffed settees and large easy chairs; while the introduction of satinwood pieces and the green color scheme of the carpets, coverings, cushions, and

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

curtains combine to counteract the usually heavy effect associated with this style of decoration. At the forward and after end of this apartment there are arranged massive marble fireplaces. Over the fireplaces are arranged beautiful enamaled panels, by Alex. Fisher, of London. The roof is raised in dome fashion to a height of 20 ft., and is decorated by plaster work of a high artistic standard. The glass work of the dome is in 12 panes, each representing a month of the year; these have been supplied by Oscar Paterson, of Glasgow. The furniture is by Waring & Gillow.

THE FIRST-CLASS SMOKING-ROOM (BOAT DECK).

Emerging from the lounge at the after-end, one passes into the first-class smoking-room, which is 55 ft. by 50 ft. The interior of this room has been completed according to the eighteenth century period, and has its walls paneled with Italian walnut, the beautiful grain and figure of the wood being enhanced by the broad simple spacing of the panels. The furniture, consisting of luxurious sofas, settees, easy chairs, and writing tables, has been designed and manufactured by that old-established firm, Messrs. Marsh, Jones & Cribb, of Leeds, who have taken the finest models of the Queen Anne period, and treated them in such a way as to combine the comfort so necessary to the ocean traveler with all the dignity and elegance that is inseparable from these fine old examples so well known and highly prized by all lovers of artistic furniture. The general tone of color introduced is an old Italian red, which, blending harmoniously with the mellow tones of the walnut, produces an effect on entering the room of quiet repose and somber richness, at the same time providing a pleasant foil to the brightness of the white and gold decorations of the saloons.

Several important parts of the decoration have been supplied by the Bromsgrove Guild, Birmingham. These include the metal work of the staircase, and of the sideboard in the saloon, electric fittings in the saloon, at the staircase and in the smoking-room; the plaster work of the lounge, smoke room, writing room, and staircases. All this work is characterized by high artistic ability and finished workmanship.

CAFE (BOAT DECK).

At the after-end of this deck there has been arranged an outside cafe, 24 ft. by 50. ft. It is bound to be popular with the passengers, being arranged with small round tables and chairs of an easy nature. The cafe is very brightly lighted; and at night when all the lights are ablaze it has a magnificent appearance.

PROMENADE.

The promenades for first-class travelers on boat and promenade decks are both broad and long, and there is ample space for passengers to seat themselves in camp chairs at full stretch, and yet leave a good width of deck for promenaders.

SECOND-CLASS ACCOMMODATIONS.

The second-class accommodation is hardly distinguishable in character from the first-class ordinary cabins. There is a dining room, drawing room, smoking room and lounge, all handsomely decorated.

The dining room, 60 ft. long and the full breadth of the ship, is a large and handsome apartment of Georgian style, with delicately carved panels and pillars, the decoration being in white; overhead is a circular well surrounded by a handsomely-carved balustrade. At the fore-end of the saloon a beautiful sideboard of mahogany has been placed; it is very ornate and admirable in design.

The second-class drawing room, 28 ft. by 42 ft., is in a gray tone, and of the Louis XVI style. This room has been admired very much by competent judges of art decoration; it has a richness about it that at once captivates. The rose of the carpet and curtains, the satinwood furniture, and the general gray of the walls, all make a splendid contrast. This room (although termed the drawing room) has been furnished with writing tables and bookcases, so that it serves as drawing room, writing room, and library.

On the other side of the main second-class entrance on this, the promenade, deck there has been arranged the smoke room, which is 52 ft. long by 33 ft. wide. Like the lounge, it is Georgian in design, with mahogany paneling and furniture, and a ceiling of white, and a dome of plaster work. At the forward end is a handsome mosaic panel by Guthrie & Wells, Glasgow, representing a river scene in Brittany; throughout the apartment, small square tables and comfortably upholstered chairs have been arranged. The interior, or sliding windows, have a milky bluish hue, which looks splendid during the daylight.

The lounge, 42 ft. by 40 ft., is an innovation for this class of passenger, and is fitted out in mahogany, and arranged with easy chairs and settees, small tables for the service of coffee, etc. The second-class public rooms have been generally treated as regards design in a light style.

The cabins are fitted, finished, and decorated in almost exactly the same way as the first-class accommodation.

The designs for all the public rooms were made, in consultation with Mr. James Millar, R. S. A., F. R. I. B. A., by Messrs. John Brown & Co.'s own architect, Mr. Robert Whyte.

THIRD-CLASS ACCOMMODATION.

The advance in the convenience and comfort of the third-class accommodation is as marked as in the cases of the first- and second-class. The forward end of the vessel, from the lower to the forecastle decks, is given up entirely to the third-class passengers, located in cabins containing two, four, or six berths, and in these 1,200 passengers can be accommodated. The stairways leading to this accommodation are of great width, so that ready passage is given under all circumstances to the immense number of people who may require to use them. The third-class dining room, 79 ft. long by 60 ft. wide, is a special feature, situated forward on the upper deck. There can dine at one sitting 350 passengers. It is fitted out in polished pine, with square windows over the sidelights; circular reversible seats are fitted, and altogether the saloon has a fine appearance. A piano is placed at the fore end of the saloon. On the shelter deck two large public rooms are arranged for the third class, namely, ladies' room and a smoking room. These are fitted up in the same style as the dining saloon. The forecastle deck side-plating has been carried well aft, and the promenade or shelter deck thus enclosed has been fitted with side seats. This forms, for a length of at least 150 ft. on each side of the ship, a lounge for the third class. It is open, of course, at the aft end, but is still sheltered from the elements, if they are boisterous; so that the third-class cannot be considered to be cabined and confined in bad weather.

NUMBER OF PASSENGERS.

The following table shows the accommodation for the various classes of passengers:

First Class (540 passengers)—36 one-berth rooms, 150 two-berth rooms, 72 three-berth roms. Total, 260 rooms.

Second Class (460 passengers)—60 two-berth rooms, 85 four-berth rooms. Total, 145 rooms.

Third Class (1,200 passengers)—40 two-berth rooms, 237 four-berth rooms, 21 six-berth rooms, 4 eight-berth rooms. Total, 302 rooms.

The dining accommodation is as follows:

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

First Class.—Upper saloon, seats, 150; lower saloon, 350; children's saloon, 40. Total, 540.

Second Class.—Seats, 260.

Third Class.—Main saloon, seats, 340; ladies' room, 90; smoke room, 110. Total, 540.

SANITATION.

A special feature in the vessel is the sanitary arrangement. In taking a walk round, the large numbers of bathrooms and lavatories will be noted, and their close priximity to the staterooms. This should be highly appreciated by pasesngers of all classes. The sanitation throughout is of the most complete and scientific kind, the system of flushing, trapping, etc., being far in advance of anything hitherto carried out on a large scale, while the plumbing work is perfect. The baths for the first and second class are fitted in large and well-appointed bathrooms, those for ladies having a retiring room adjacent. A large number of needle-baths are fitted throughout the first-class accommodation. All the lavatories are well lighted and beautifully tiled on floors and walls.

The third-class accommodation has all the lavatories arranged at the entrances—for women on the starboard side, and for men on the port side.

THE CULINARY DEPARTMENT.

The culinary department on a vessel like the Lusitania takes a most important place. Great care and thought have been exercised by the builders, who were greatly assisted in the arrangement of galleys, pantries, stores, etc., by the advice of the Cunard Co.'s experienced staff. The galley for the first and second class is placed between the two dining-saloons, and is impressive in its great size, and suggestive also of the importance attached by the company to the cuisine. The main range—30 ft. long and 9 ft. broad—is placed in the center of the apartment, and all the minor grills, roasters, etc., ranged round the sides. A bakery, confectionery, butcher's shop, larders, bar, still-room, silver-room, etc., with scullerries, are all adjacent. Large pantries for each dining saloon extend across the ship, and are fitted with large serving windows; so that even a casual view arouses but one opinion—that this department is of paramount importance. The arrangements are such that the various courses can be served almost direct from the galley to the tables, and there should be no cause for complaints on the score of the viands being served cold, or of impromptitude. All the working appliances have been supplied by Wilson, of Liverpool, and are of the latest types.

Pantries are also placed for the serving of the public rooms on the shelter deck, and are fitted with all the requisites necessary for the voyage.

The third-class galley is placed at the fore-end of the shelter deck-house; it has all the modern appliances. The service is direct to a large pantry underneath and adjoining the aft-end of the dining room.

The stores for the ship's use are all on the lower deck, directly under the first and second class galley and pantries. There are store for all kinds of eatables, and of wine, poultry store, potatoes and vegetables, beef and mutton, flour, etc., with a large ice-room. All these stores are insulated, and kept at a certain temperature by means of refrigerating machinery. Electric hoists are fitted for the easy handling of the stores, when victualing of ship or when transferring them to pantries and galleys.

CREW AND THEIR ACCOMMODATION.

The crew's accommodation is, needless to say, in keeping with the magnificence of the rest of the vessel. The officers' and engineers' rooms are placed in the most suitable spot for convenience in getting to and fro from their work. Mess rooms and smoke rooms are supplied both for engineers and officers.

The firemen's and greasers' quarters are situated on the main deck; these compartments are large and airy, being divided up to suit the number of men for each watch, so that the awakening of those to go on watch does not disturb others asleep. A dining room is provided for their use, with a galley adjacent. Large lavatory accommodation has been provided for them, with baths and sprays. The accommodation is centrally situated, and there is a special entrance, so that the members of the crew can go direct into their roms without having to transverse half of the ship.

The stewards are berthed at various parts of the main and lower decks, but principally at the aft end.

The finish of all the crew spaces is first class, with plenty of light and air.

The ship's complement is as follows:

Captain and officers	9
Engineers	33
Seamen	40
Quartermasters	8
Boatswains	3
Carpenters and joiner	3
Lamp-trimmer and yeoman	2
Firemen	192
Trimmers	120
Greasers	21
Refrigerating engineers	3
Masters-at-Arms	2
Doctor	1
Purser	1
Assistant pursers	2
Chief steward	1
Chief steward's assistants	2
Chef	1
Barbers	2
Cooks and bakers	28
Matrons	2
Stewardesses	10
Mail sorters	7
Typists	2
Marconi telegraphists	2
Leading stewards, barkeepers, etc.	50
Stewards	280
Total	827

WIRELESS TELEGRAPHY.

An installation of the Marconi system of telegraphy has been fitted on the vessel. A special receiving-house is located on the boat-deck, where all the machines are housed.

MAILS.

The mail room is fitted aft on the orlop deck, the fitting out arrangement having been under government supervision. The postal clerks' rooms are overhead, with sorting-room at hand.

NEWSPAPER OFFICE.

As is usual now in all the big liners, a printing establishment has been provided, fitted with one of the latest printing machines.

HOSPITALS.

Hospitals have been arranged on the shelter-deck amidships, separate hospitals being arranged for infectious diseases for both sexes. These hospitals have been fitted out in the most complete manner, and have dispensary, lavatories, and bath-rooms.

VENTILATION.

The ventilation of the vessel is of the most improved description. Fans driven by motors are fitted throughout the ship, for the purpose of adding to the already perfect system of natural ventilation. The heating arrangements are on the most improved practice. The thermo-tank system has been adopted, and is fitted throughout the ship. There are in all about 48 thermo-tanks, and each has its special portion of the vessel to cover. These supply cool or hot air, to meet the temperature requirements of the seasons or of the hour. Electric heaters have been greatly resorted to in public rooms, suite rooms, and special cabins, and advantage has been taken of them for decorative effects.

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

LIFE-SAVING APPLIANCES.

The vessel is supplied with efficient life-saving appliances. There are 16 boats stowed on the boat deck. These boats are of the latest design, and the lowering gear is so arranged that the boats can be got to the water in the shortest possible time.

SUBSIDIARY MACHINERY.

The subsidiary machinery with which the vessel is equipped may be mentioned: The steering gear, by Messrs. Brown Bros., is situated entirely under water, to meet the requirements of the Admiralty. It is controlled by Brown's patent telemotor gear. There are cargo winches by Messrs. Wilson, of Liverpool; capstan and windlass gear by Napier Bros., Glasgow; sanitary fittings by Messrs. Shanks, of Barrhead; Stone Lloyd's system of watertight bulkhead doors, 35 in number; thermo-tank system of heating and ventilation; four 12-cwt. electric cranes by Messrs. Stothert & Pitt, who also fit the four electric-boat hoisting winches; electric hoists to the mail and baggage rooms, galleys, pantries, etc., by Messrs. Waygood; refrigerating machinery by the Liverpool Refrigerating Co.

ANCHORS AND CABLES.

The anchors and cables, which are the largest that have been manufactured, are by Messrs. Hingley, of Netherton Works, Dudley. Each anchor weighs 10 tons, while the 1,800 ft. of cable is composed of 24-in. links, each 3¼ in. in diameter, and weighing 1½ cwt. An anchor-crane of suitable size to lift anchors is fitted at the fore-end.

THE MICROCOSM AND ITS RULER.

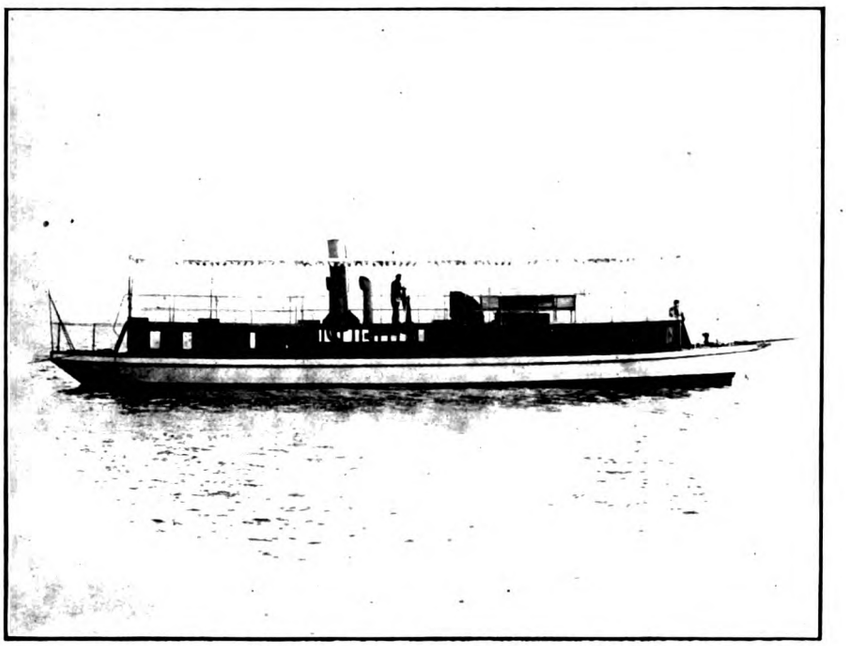
The vessel will sail under the command of Captain Watt, who vacates the command of the Campania to take up this new appointment. Under his command there will be a staff of 827 persons, who, together with the passengers, make a grand total of 3,100.

MOTOR YACHT SWIETLANA.

Although motor yachts for sea and river are very numerous in all parts of the United States, they have not, for some unaccountable reason been taken up to any extent in the United Kingdom, and the few boats hitherto in use in England do not approach to anything like the standard of elegance and comfort which characterises the American craft.

The boat which is the subject of this article is therefore, of considerable interest, from the fact, that, although not for British waters, it is by far the largest motor yacht yet constructed by English builders, and embodies the latest and most up to date devices and arrangements as regards design of hull, propelling equipment and cabin accommodation.

The yacht has been designed and built by Messrs. John I. Thornycroft & Co., Ltd., of Chiswick and Southampton, to the order of a Russian gentleman, who intends using her on the rivers of Central Russia.

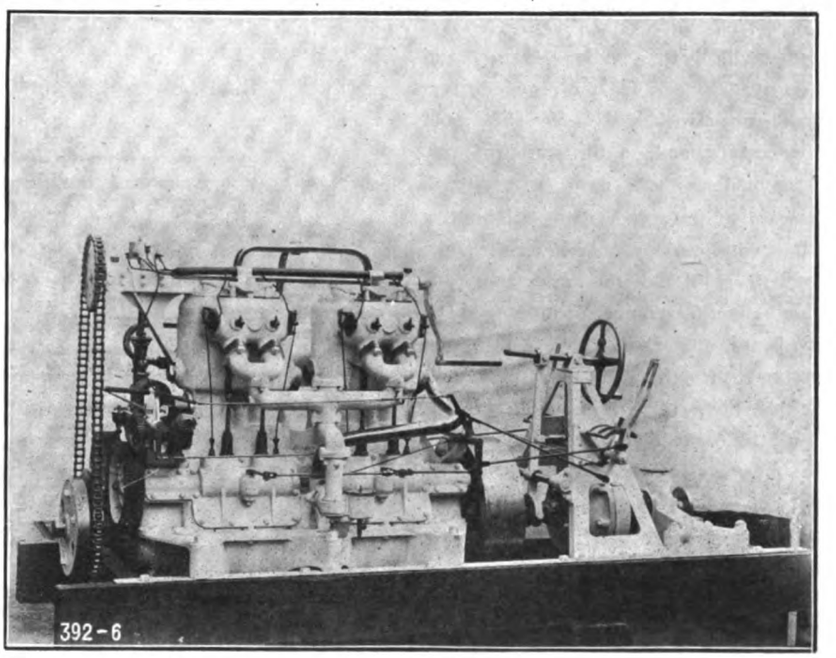


MOTOR YACHT SWIETLANA.

The dimensions are, length on deck 78 ft.; length on waterline 70 ft.; beam 13 ft.; depth 4 ft. 9 in.; draft loaded (on trial) 1 ft. 9 in.

The propelling machinery consists of two Thornycroft motors, each having four cylinders, 6 in. diameter by 8 in. stroke developing 50 B. H. P., or 100 B. H. P. together. The power is transmitted to twin propellers working in tunnels to insure proper immersion.

The machinery is of the type which has been supplied by Messrs. Thornycroft and is now in use largely in government, mercantile and pleasure vessels, and its simplicity and ease of handling is proved by the fact that vessels fitted with this machinery, in the service of the Southern Nigeria Marine, running on the Niger and tributaries, are being sat-



ENGINES OF THE MOTOR YACHT SWIETLANA.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

isfactorily worked by hitherto inexperienced natives.

The fuel used is ordinary commercial paraffin, and not petrol spirit, though it may be used if desired by means of a special type of change over throttle valve. By means of this, when running on petrol, the carburettor is in connection with the inlet pipe of motor and when on paraffin the vaporizer is connected in place of the carburettor. The exhaust is taken through the vaporizer in either case, so that when it is desired to change to paraffin from petrol it may be done instantly.

The economy of working with paraffin fuel is a special feature of the engines.

The exhaust gas from the motors is led into a silencer fitted in the funnel amidships, and the three-toned signal horn is operated by the exhaust gas.

The hull is built of Siemens-Martin steel plate galvanized. The schooner bow is finished off with an attractive carved figure head and bowsprit, and the stern is elliptical. A hand capstan is fitted on the foredeck.

A promenade deck extends for a length of about 56 ft. over the cabins, on which are placed the steering wheel, engine room telegraph and some sparred seats. An awning covers the whole of the deck, supported by brass stanchions.

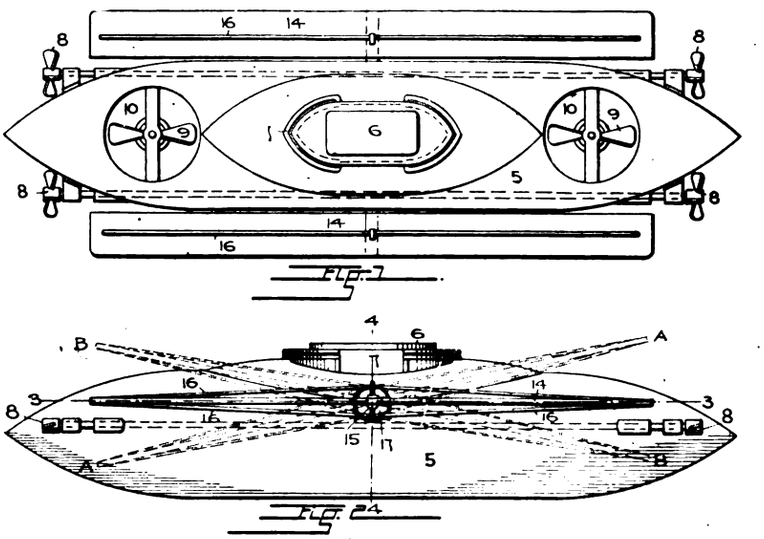
The internal accommodation is ample and very conveniently arranged. A commodious saloon extends across the forepart of the vessel, having sofa seats, sideboards, dining table, and other accessories. Aft of this saloon are two state rooms with berth, folding lavatory and the usual fittings. On the port side is a large pantry with shelves, ice-chest, and other details, and on the starboard side a commodious bath room is arranged. Forward of the motor room bulkhead, a galley with cooking stove, dresser, etc., is fitted up. Aft of the motor room another saloon is arranged, with sofa seats, side board, dining table, etc. This saloon is entered from a companion placed on the port side. On the starboard side opposite the companion, a lavatory is fitted. The crew are located at the after end of the vessel, their cabin being fitted with seats and lockers. The cabin windows are fitted with sliding jalousies.

The finish throughout, both internal and external, is of the highest class.

Trials have been run in Southampton water and the Solent, when a mean speed of 12½ miles per hour was attained. In view of the ample beam, and load carried, this was considered highly satisfactory.

SUBMARINE BOAT.

The accompanying drawings illustrate certain novel improvements in means of governing the course of submarine boats, and, when submerged, aiding in supporting and retaining them at the required depth.

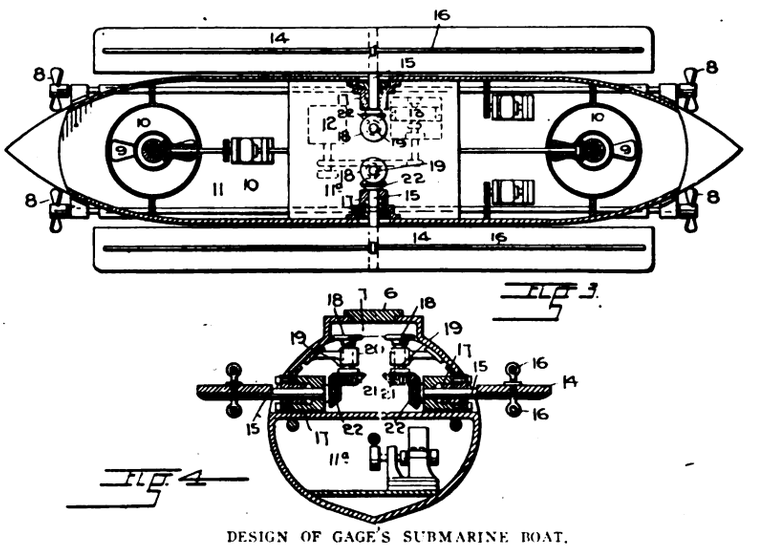


DESIGN OF GAGE'S SUBMARINE BOAT.

There are two claims to this invention.

Fig. 1 represents a plan view of a submarine boat equipped with the apparatus; Fig. 2, a side elevation, showing the apparatus in three positions; Fig. 3, a longitudinal section taken along a line 3-3 (shown in Fig. 2), and Fig. 4, an enlarged vertical cross section taken along a line 4-4 in Fig. 2.

Referring to the drawings, 5 represents the cigar-shaped shell or hull of a submarine boat, access to the interior of which may be had by means of a normally hermetically closed hatch 6 opening in the upper surface of the conning tower 7. The boat may be propelled while upon or under the surface of the water by means of four screw-propellers 8, while its vertical movements are controlled by the horizontal submerging screws 9, which are revolubly mounted inside vertical, transversely arranged funnels 10.



DESIGN OF GAGE'S SUBMARINE BOAT.

Both modes of propulsion have been made subjects of separate applications for patent.

The interior of the boat has been divided into two compartments 11 and 11a, which are used respectively as operating and engine rooms. The latter, which is preferably located in the middle of the boat, contains the gasoline engine 12 which operates a dynamo electric machine or generator 13 by means of which the various motors employed to actuate the propelling and submerging appliances are energized. The steering apparatus consists of two horizontal planes or rudders 14, which extend longitudinally along the sides of the boat, and are

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

pivotally mounted thereon by means of central laterally extending shafts 15. Rudders 14 are preferably located above the longitudinal center line of the boat and are strengthened by judiciously applied truss rods 16, to enable them to withstand the pressure caused by the resistance of the water through which the boat is moved. At the points where shafts 15 project through the sides of the vessel, stuffing boxes 17 have been applied to insure water-tight joints, the said boxes having been made sufficiently large and heavy to act as journal bearings for the shafts extending through them.

To incline the rudders in either direction, shafts 15 may be rotated by means of handwheels 18 secured to the upper extremities of vertical shafts 19 which are revolubly mounted in suitable bearings 20 and are preferably located in the conning-tower of the boat. The lower extremities of shafts 19 are provided with bevel gear wheels 21 which, meshing into corresponding wheels 22 secured to the inner extremities of the horizontal shafts, cause the latter to rotate when the hand wheels are turned.

To submerge the vessel the rudders are inclined towards the prow of the boat, so as to depress its nose and cause it to descend, while the upward movement of the shell may be attained by reversing the position of the rudders. When it is desired to turn the boat, the rudder on the side towards which the vessel is to be directed is placed in the forward inclined position, and the other rudder is simultaneously tilted in the opposite direction. The planes may furthermore be employed to act as brakes when the vessel is propelled upon the surface of the water, and, during submergence of the boat, they aid in supporting and retaining it at the required depth.

The inventor is John M. Cage, of Denver, Colo.

THE NOTE-BOOK.

Food valued at $2,500 arrives in Great Britain every minute of the day and night.

There is an average of 102 immigrants from Russia landing in New York city each day.

The Sirius, the first steamer to cross the Atlantic, was 178 ft. in length, and of 450 tons.

The light of one candle power is plainly visible at one mile, and one of three candle power at two miles.

In Norway and Sweden 36 persons out of every thousand live by seafaring. The next best average in this particular is the British Isles, where there are 17 for every thousand.

The wreck record of the Baltic sea is greater than that of any other part of the world. The average is one per day throughout the year.

Excluding about 80,000 small craft, the commerce of the world is carried on by 30,100 vessels, of a total tonnage of about 25,000,000.

The Antartic exploring ship Nimrod has, as part of her equipment, a motor car and enough tobacco to supply each man with a pound per month for two years.

The average life of an American ship is only 18 years, while that of a British vessel is 26 years. The Scandivanian average is the highest—30 years.

An immerse copper lantern is to form the pinnacle of the Singer building, will be 612 ft. from the sidewalk, and from which at night a powerful searchlight will be visible 60 miles at sea.

Five hundred dollars for a night's fishing was realized at Scarborough recently by the Kirkcaldy herring vessel No. 111, which landed 100,000 herrings. They sold at from $4 to $5 per 1,000.

While clearing away the wreckage of the channel steamship Hilda, which was lost near St. Malo in 1905, the wrecking boat brought up two ancient cannons of the seventeenth century, and which are probably relics of another wreck.

Although there are only 18 flags used in the International Code of Signals, which is used by warships and merchant ships all over the world, they can be made to represent no fewer than 20,000 distinct signals, and by its use 50,000 ships can be designated.

At Cape Breton there are immense collieries being worked under the sea. These submarine mines cover a thousand acres and are being increased steadily. The mines are entered at the shore and the operators follow the vein beneath the water for more than a mile.

Tenders were recently invited for the erection of a small building for the British Admiralty at Portland, the cost not to exceed $150. Shortly before the tenders were opened orders were received that the work was not to be proceeded with, owing to the fact that "My Lords" had no money to spare.

A return dealing with trans-Atlantic mail carriage was issued in England recently. It shows that on the outward journey the quickest delivery of mails was by the Lucania, the bags reaching New York post office in 5 days 14 hours 38 minutes. The eastward mails of the Kaiser Wilhelm II were delivered at Plymouth on one occasion 5 days 12 hours 40 minutes after leaving New York.

A large fisheries company operating in the Atlantic keeps track of the shoals of fish by means of wireless telegraphy. The fleet comprises 40 vessels. When the coasting steamships sight the fish they can communicate immediately their movements to the other vessels. Likewise, a part of the fleet finding fish at one point may notify the rest of the fleet and assemble the ships from remote points without delay.

On board the battleship Agamemnon, now being finished in Beardmore's, Scotland, it is customary for the various tradesmen to chalk a notice, as follows, on any articles acquired for their work: "Wanted—not to be taken away." This prevents the small army engaged in "redding up things" from taking away articles required for work which is unfinished. The other morning a broad smile was caused by the above notice very prominently chalked on one of the 120-ton guns lying on the dockside.

By good navigation and the quick work of the crew, a fireman on the White Star liner Teutonic was rescued at sea on the last west-bound passage, after he had jumped overboard while temporarily out of his mind from the heat in the fire rooms. Immediately on the alarm the liner made a quick turn and swung 'round on her track, slowed down, and lowered a boat. The man was picked up, the life boat hoisted on board, and the Teutonic continued her voyage within 15 minutes of the alarm. Though this is no uncommon incident in the North Atlantic service, it is seldom the termination is so satisfactory.

Naval experts put the active life of a battleship at about 15 years. One hundred years ago battleships lasted nearly six times as long, and were on active service nearly the whole time they were in commission. The Victory, for instance, was 40 years old when she acted as Nelson's flagship at the memorable battle of Trafalgar. A line-of-battleship, the Royal William, was built at Chatham in 1670, and was not broken up until 1813, being "rebuilt" several times before her final demise.

A correspondent in the *London Times* calls attention to the power exerted by the porpoise. He calculates that 15 H. P. is exerted by the porpoise when moving at the rate of 20 miles an hour, and asks how such a power could be acquired. He suggests that the explanation may lie in the reduction of the skin friction by a system of glands which continually exude oil, and that therefore such a calculated power is not developed. He also asks whether a mechanical imitation of nature's process might not be possible for the hulls of ships.

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

THE MARINE REVIEW

DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

Published every Thursday by

The Penton Publishing Co.

CLEVELAND.

BUFFALO ..... 932 Ellicott Sq.
CHICAGO ..... 1362 Monadnock Blk.
CINCINNATI.....First National Bank Bldg.
NEW YORK .....1005 West Street Bldg.
PITTSBURG ..... 521 Park Bldg.
DULUTH.....411 Providence Bldg.

Correspondence on Marine Engineering, Ship Building and Shipping Subjects Solicited.

Subscription, U. S. and Mexico, $3.00 per annum. Canada, $4.00. Foreign, $4.50. Subscribers can have addresses changed at will.

Change of advertising copy must reach this office on Thursday preceding date of publication.

The Cleveland News Co. will supply the trade with the MARINE REVIEW through the regular channels of the American News Co.

European Agents, The International News Company, Breams Building, Chancery Lane, London, E. C. England.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

September 5, 1907

YOUNGER MEN TO COMMAND.

At the last meeting of the Society of Naval Architects and Marine Engineers it was pointed out quite dramatically by Col. Thompson, one of the speakers who had recently returned from a cruise on board a British battleship, that the American navy was lacking in efficient commanders. Battleships were commanded by old men and that by the time they retired under the age limit their successors would also be old men. He held quite forcibly that a man who has held a subordinate position all his life is not competent to assume command in old age, and he pleaded for the immediate advancement of younger men to commands. It is interesting therefore to observe that the biggest shake-up in the history of the United States navy is now being arranged by the secretary of the navy with the approbation of President Roosevelt. Of the officers now commanding the eighteen battleships to make the long voyage from the Atlantic to the Pacific it is claimed that only four captains now commanding ships will make the trip. It has been decided to advance young men to the fighting line and to put their elders on shore duty. There is no intention to reflect upon the old commanders who are all of them thoroughly competent, but the move is apparently made to continue present efficiency.

THE MARINE ENGINEER.

On Saturday, August 17, 1807, one hundred years ago, the engines of the Clermont responded to the hand of the engineer on the lever, and throbbed their way up the Hudson on the maiden trip of a steam-driven vessel. The engines may not have been things of beauty, their movement the poetry of motion, or the four and a half miles per hour a terrific speed, yet the heart of the engineer must have been glad within him as he watched his charge with anxious eye, realized his responsibility, and felt the importance of his position.

The engineer of today is as the engineer of ten, or ten times ten, years ago. His duties and responsibilities may have increased one hundred-fold, yet there is the same watchful care exercised and no detail too trifling for his consideration in the great mass of machinery in his charge. From the single cylinder engine to compound, compound to triple, single screw to twin screw, triple to quadruple, four cylinder quadruple to six cylinder quadruple—the march of expansion has advanced. Although it is only a matter of about ten years since the first turbine-driven vessel was built for passenger service, a week hence we will witness the arrival in the Hudson of the turbine-propelled Lusitania, the first of the two great Cunarders to go into service, the largest and fastest ship in the world. The engineer on the turbine-driven ship handles his charge as if born to it, and awaits with interest the next development.

The voyager on the large Trans-Atlantic liner—not the passenger making his twentieth trip, but the casual voyager—has but a very faint idea of just how much the engineering department of the vessel is responsible for his safe-keeping and comfort. He is quite aware, by the progress of the floating hotel, that there is machinery somewhere in the interior, and, in many cases, his interest ends at that. It matters little to him, at first, that an engineer is constantly in attendance on a set of refrigerating machinery and cold storage rooms, so long as his breakfast fish is fresh and the beefsteak rich and juicy. The day of "salt horse," as far as the liner is concerned, is past. Should the light in his stateroom need attention, a quiet-looking individual (whom he has noticed occasionally on the voyage) arrives to set things right. He is surprised to learn from said individual that there is a large dynamo room expressly for supplying electric power throughout the ship, an electrician constantly on duty, motor-driven fans throughout the ship ventilating the passenger quarters and supplying warm or cool air as required, electric controlled elevators, signals, steering gear, horns, and the one hundred and one uses to which electricity is put aboardship.

He will, one day, explore the mysterious recesses of the main deck, and discover that the rudder is controlled by a monstrous steering engine, and that more large engines form the roots of the windlass and capstans seen on the upper deck. He is surprised to learn, also, that the warm salt water in his morning bath is driven by a pump from the circulating water of the engine room condenser. He later decides that there must be a remarkable number of pumps down in the interior.

In the end, perhaps, he will be escorted below to where the gigantic engines are rumbling round. He will stare with dazzled eyes at the rows of gages with their twitching needles, the telegraphs, speaking tubes, tele-

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

phone, and the other equipment pertaining to the liner's engineroom. He will see the pumps, like the links of a chain, and understand that each has its peculiar stride or stroke to acquaint the engineer of its internal workings. He notes with awe the oilers gliding in and out of the moving mass of steel as they "feel round," momentarily expecting to hear a shriek of agony from somewhere in the mass. "It is all very wonderful," he says, when turning to ascend the ladder, to the cool, confident-looking, individual in overalls—the engineer on watch.

When later he bows courteously to a passing officer on deck, he will turn to his friend and say, with the conscious pride of acquaintanceship, "That is the chief engineer."

BURTON AS MAYORALTY CANDIDATE.

The nation in general will be interested in the coming mayoralty campaign in Cleveland for the reason that Hon. T. E. Burton, chairman of the committee on rivers and harbors of the house of representatives, has consented to accept the Republican nomination for mayoralty. Mr. Burton has been sent to congress by the city of Cleveland almost continuously for the past twenty years and for many years he has occupied the important position of chairman of the committee on rivers and harbors. He had some time ago decided to retire from this position so that his election or defeat will have no bearing whatever upon this office. It will be necessary to find another chairman for the committee on rivers and harbors. Some few months ago Mr. Burton was appointed by President Roosevelt as chairman of the Inland Waterways Commission, and this position he will probably retain regardless of the mayoralty outcome in Cleveland. His election to the mayoralty, however, will result in the elimination from congress of one of its most conspicuous figures.

TWO MORE LAKE VESSELS.

The steamer E. B. Osler, building for the Chicago & St. Lawrence Steam Navigation Co. of Toronto at the Niagara yard of the Canadian Ship Building Co., will be launched on Saturday, Sept. 7. This bulk freighter is 510 ft. over all, 500 ft. keel, 56 ft. beam, and 31 ft. deep, and is equipped with quadruple-expansion engines and Scotch boilers. Her construction is unusually staunch, having as much steel worked into her as is usually put into a 550-footer. She has a lower stringer 5 ft. below the spar deck extending from the hatch opening to the ship's side, and a girder of that depth connecting the two stringers in line of hatches. The hatches are spaced 24 ft. centers and are 10 ft. 6 in. wide fore and aft. The steamer is built on the arch girder system, with arches every 12 ft. Her construction has been superintended by Mr. Robert Curr, naval architect of Cleveland.

In this connection it is interesting to mention that the Caledon Ship Building & Engineering Co., Ltd., of Dundee, Scotland, launched on Aug. 15 a vessel for the Chicago & St. Lawrence Steam Navigation Co. which is somewhat out of the ordinary run of steamers, embodying several improvements on former vessels that have been built abroad for lake service. Hitherto the great difficulty has been to prevent these steamers from trimming by the head and to meet the owners' special requirements in this case the boilers have been placed on the deck, thereby allowing what in the usual cases is the stokehold to be used for the carrying of cargo, and thus getting the vessel on an even keel.

The new steamer is named G. R. Crowe and is of the following dimensions: Length over all, 259 ft. 6 in.; breadth, molded, 43 ft. 3 in., and depth, molded, 26 ft. Her gross tonnage is 2,400 tons. The steamer is built to the highest class of the British Corporation Registry, and is intended to be one of the best equipped vessels in the Canadian lake service. Her engines are triple-expansion, with cylinders 18 in., 29½ in., and 48 in. diameter, with a stroke of 36 in., supplied with steam from two boilers working at a pressure of 180 lbs. per square inch. The construction of the vessel has been under the supervision of Capt. Crangle, the company's superintendent.

CAR LOADING RECORD.

Duluth, Sept. 2.—Dock No. 1 of the Pittsburg Coal Co. at Duluth broke the car loading record last week in handling the cargo of the steamer Bransford. The dock unloads with six McMyler rigs directly through bins into the railroad cars and the cargo of 5,100 tons was unloaded and loaded again into 226 cars in 10 hours. This work involves the weighing and switching both before and after loading of every car which operation at the rate of a car every 2:65 minutes is a very creditable performance. The previous record for 10 hours was the handling of 2,800 tons into 126 cars.

The receipts and shipments of grain for the week ending Aug. 31 are as follows and it will be noted that the wheat shipment was very large:

	Receipts.	Shipments.
Wheat	161,841	1,053,746
Corn	1,521	.....
Oats	28,137	24,951
Rye	4,615	.....
Barley	86,135	30,818
Flax	35,218	108,545

SALT LAKE CITY LAUNCHED.

The steamer Salt Lake City was launched on Thursday last at the South Chicago yard of the American Ship Building Co. for W. A. & A. H. Hawgood, of Cleveland, and was christened by Miss Dorothy Holmes. The Salt Lake City is 552 ft. over all, 532 ft. keel, 56 ft. beam and 31 ft. deep. Her engines are triple-expansion with cylinders 23½, 38 and 63 in. diameters by 42-in. stroke, supplied with steam from two Scotch boilers, 14½ ft. in diameter and 11½ ft. long. Capt. James Owen will command her and John Chapman will be her chief engineer.

DANGER AT PORT HURON.

At a meeting of the executive committee of the Lake Carriers' Association held this week the following was adopted:

"The executive committee of the Lake Carriers' Association has again had its attention called to the danger of ships passing, going in the same direction, between the foot of Lake Huron and the lower end of the middleground opposite Sarnia. The committee, therefore, recommends and urges, and so far as it can, will insist against ships passing each other, going in the same direction, between Lake Huron lightship and the lower end of the middleground."

OBSTRUCTION NEAR COLCHESTER LIGHTHOUSE.

The United States lake survey steamer General Williams, which is engaged in sweeping in the west end of Lake Erie, reports the discovery of an obstruction 2¼ miles SE by E from Colchester lighthouse. A lone spar rises from 36 ft. of water with 11 ft. of water over it at present stage. As this is within a quarter of a mile of the course of vessels between Detroit river and Pelee Passage which take the south side of Colchester lighthouse, it is a dangerous menace. It has been temporarily marked by a spar buoy flying a white flag with a red center.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

LAKE SHIP YARD METHODS OF STEEL SHIP CONSTRUCTION

BY ROBERT CURR.

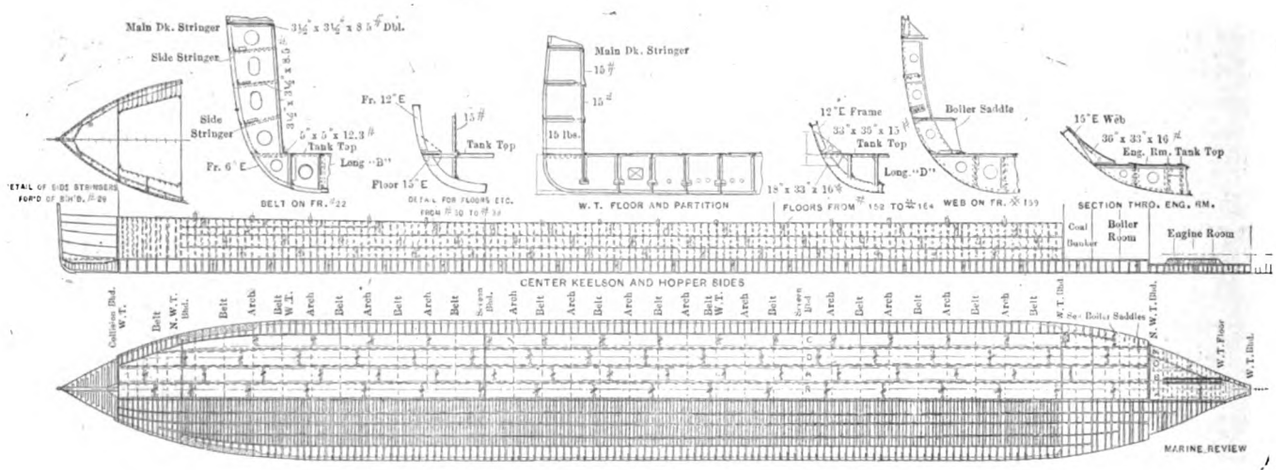


FIG. 6.

The first part of the vessel to be considered for punching is the keel plate; a solid mold is made for same and the holes drilled to suit the angles for center keelson, channel floors and straps. Molds are also made for the straps and liners which run between the straps and the liners under the channel floors, termed frame liners, which completes the keel plate mold.

The plates are marked, punched, countersunk, rolled and erected on the keel blocks in the vessel way.

The A strake plating mold is next gone on with and finished; 80 per cent of the plates on both sides are marked from this mold. B strake comes next with the frame liners, one mold serving the purpose of laying off 80 per cent of the strakes B and C, and one frame liner mold serving the purpose of marking all the liners on B strake where the plates remain the same width.

D strake is also gone on with, care being taken to ensure the necessary material on the girth of the bilge. This is done by either bending a piece of plate the thickness of D strake and punching the holes in same before straightening out or bending a piece of wood around the bilge, the wood being the same thickness as D strake and marking the rivet holes upon the wood so that when the batten is let loose from the floor it will become straight and give the true position of the rivet holes.

E strake is also laid out by mold

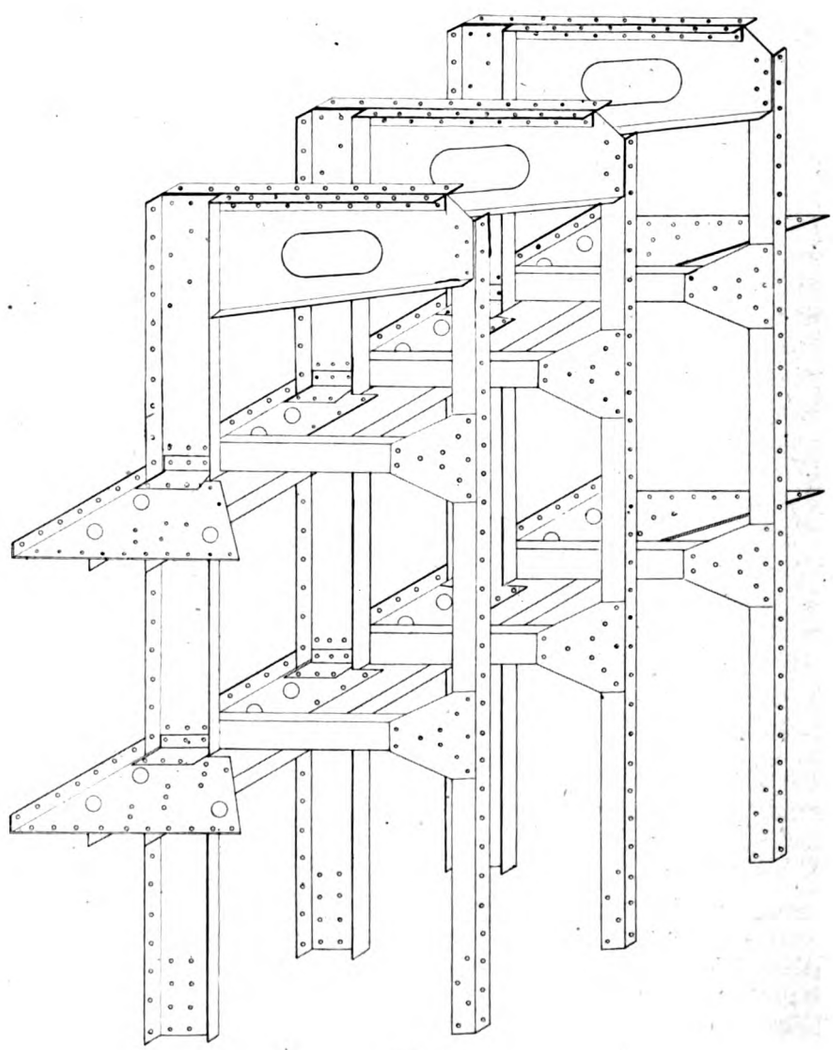


FIG. 7.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

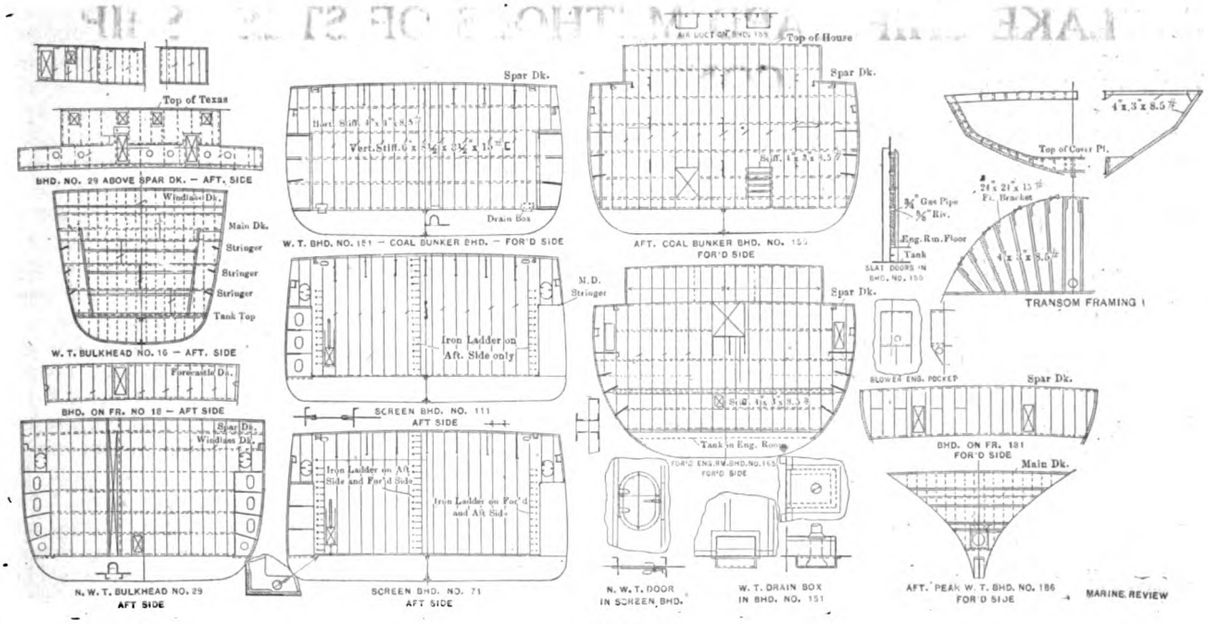

Top of Texas
BHD. NO. 29 ABOVE SPAR DK. — AFT. SIDE
Windlass Dk.
Main Dk.
Stringer
Stringer
Stringer
Tank Top
W. T. BULKHEAD NO. 16 — AFT. SIDE
Forecastle Dk.
BHD. ON FR. NO 18 — AFT SIDE
Spar Dk.
Windlass Dk.
N. W. T. BULKHEAD NO. 29 AFT SIDE
Spar Dk.
W. T. BHD. NO. 151 — COAL BUNKER BHD. — FOR'D SIDE
Drain Box
Iron Ladder on Aft. Side only
SCREEN BHD. NO. 111 AFT SIDE
Iron Ladder on Aft. Side and For'd Side
Iron Ladder on For'd and Aft Sid
SCREEN BHD. NO. 71 AFT SIDE
Top of House
Spar Dk.
AFT. COAL BUNKER BHD. NO. 151 FOR'D SIDE
M.D. Stringer
Spar Dk.
Tank in Eng. Room
FOR'D ENG. RM. BHD. NO. 155 FOR'D SIDE
N. W. T. DOOR IN SCREEN BHD.
W. T. DRAIN BOX IN BHD. NO. 151
Top of Coal Pl.
Gas Pipe
Eng. Rm. Floor
Tank
SLAT DOORS IN BHD. NO. 155
TRANSOM FRAMING I
BLOWER ENG. POCKET
Spar Dk.
BHD. ON FR. 181 FOR'D SIDE
Main Dk.
AFT. PEAK W. T. BHD. NO. 186 FOR'D SIDE
MARINE REVIEW

FIG. 8.

and the same care being taken as D strake at the butts.

The center keelson is gone on with after the plating and laid off with a mold, the top and bottom angles having a uniform pitch of rivet holes.

The top and bottom angles are laid off with short battens having a uniform pitch of rivet holes which are moved along until the whole length of the angle is marked. The center keelson vertical angles are marked from two molds, a right and left or one mold Tee shaped. These angles are riveted to the center keelson before the floor and connections are put up, care being taken that the space between the angles is kept the thickness of the center keelson brackets.

The bottom angles are punched and erected in place on the keel and the center keelson plate dropped in between same and riveted up.

The top angles are also erected, bolted and riveted up as well as the stiffener angles, thus completing the center keelson and leaving everything clear for the completed floors being put up in place.

The midship section shows more clearly the pieces composing the bottom framing. A mold is made for the channel floor, center keelson bracket, bilge bracket, bilge angle, girder stiffeners, intercostal clips, tank top stiffeners, intermediate stiffeners and brackets which composes the bottom frame of the vessel.

The channel mold for the floor requires three pieces, viz., the mold for the web, strip for shell holes and strip for continuous angle or girder holes.

Center keelson and bilge bracket require only one mold and the holes for the shell flange of the bilge angle are squared across from the mold used for same and gaged from the heel of the angle to the center of the hole, thus doing the laying off with one mold. Girder stiffeners and intercostal clips are marked with a tee-shaped mold, forming a right and left angle for the port and starboard side of the vessel.

Tank top stiffeners and intermediate angles require two molds for each, one for the tank top holes and the other for the brackets on standing flange connecting same to the girders.

The channel floor, bilge and center keelson brackets, intercostal clips and girder stiffeners are riveted together and erected in place in one piece.

The girders are laid off with strips, one mold serving the purpose of all holes for the stiffeners and top angles; holes are marked from another mold the width between the tank top stiffener and intermediates. The bottom angle has a uniform spacing of rivet holes so that a mold the length

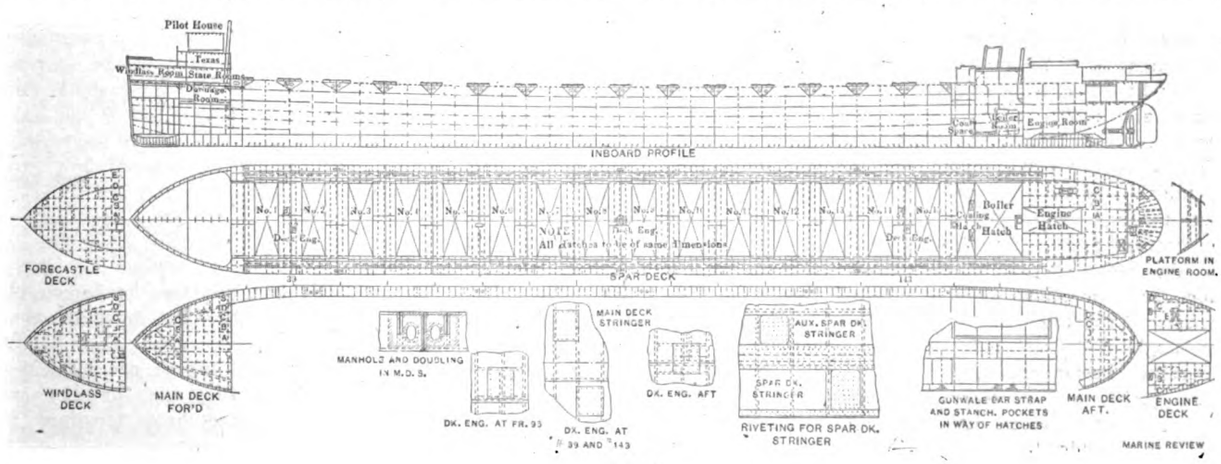


FIG. 9.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

of the frame spacing is all that is needed in marking the bottom of the girder plates.

The molds used for the girders are six in number, viz., the girder stiffeners, butt laps, intercostal top angles, bottom angles, intermediate stiffener brackets and holes for watertight bulkheads.

The intercostal top angles and intermediate angle brackets are marked with tee-shaped molds and continuous bottom angles are marked with two strips measuring two frame spaces in length, one strip for the girder rivet holes and the other for rivets connecting the angle to channel floors.

Flanged plate intercostals are riveted to the girder between the plate and angle and to stiffeners and clips on channel floors and flanged to the shell plating.

A mold tee-shaped is made for these intercostals, allowing an intercostal to be marked for each side of the vessel from same. All the intercostals throughout the midships are marked from two molds, one for intercostals on inside shell plates and the other in way of outside plates, the only changes being made at the lap butts, where a change of holes is necessary and molds are used for that purpose.

The deep floors are made as shown by midship section for the girders to pass through continuous as well as the bottom angles. A mold is made for the plate floor in the bottom which is in one piece from the center keelson to the bilge, the top and bottom angle is in one piece also, from the center keelson to bilge.

Six molds are necessary to complete the plate frame, viz., mold for floor, two molds for top angles to take the tank top plating and floor plate rivet holes, two molds for frame, one for shell, and the other for floor plate rivet holes, and a tee-shaped mold for the girder stiffeners.

Molds are also made for the watertight divisions in the tank and the collars are molded at the same time.

It is necessary that all the deep floors, including the watertight divisions, should be erected along with the channel floors in order to get the girders in place, seeing they pass through all the plate floors. The tank top stiffeners and intermediates are left off until the girders are in place when the whole bottom is completed ready to receive the tank top plating.

The tank top plating, as shown by Fig. 6, is continuous. One mold is made for the rider plate, one for A and B strakes, and one mold for C, which serves the purpose of marking all the plates amidships until they begin to taper at the ends when a mold is made for each two plates or they are templated from the ship.

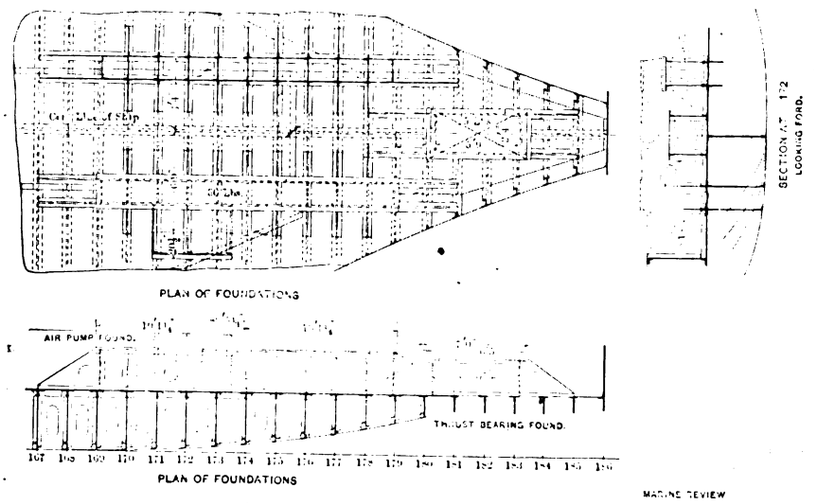


FIG. 10.

The frames all look aft from the stem to frame 136 for a length of 377 ft., which simplifies the work, seeing that the turning of the frame occurs beyond midships. At this point solid molds are made for all the parts so that it is almost impossible to get mixed up in the turning of the frame, seeing the parts are all carefully laid out on the mold loft floor.

Fig. 6 shows the arrangement of the bottom framing, tank top plating, center keelson and hopper sides, side stringers forward, frame 22, floors from 30 to 38, watertight floor and partition, floors from 152 to 164, frame 159 and section through engine room.

The hopper sides are laid out from the mold loft floor, one mold being made for A strake, one mold for B and stripes used for C strake, seeing it takes sheer on top, being connected to the main deck stringer angle or top of hopper.

The top side framing is in two pieces, being cut at the main deck line and bracketed to main deck as shown on midship section.

Molds are made for each piece to the height of the main deck, viz., frame, hopper stiffener, braces, brackets, clips, intercostals and channels between the web frames.

At the bottom of the frame the bilge bracket is continued high enough to receive the top side frame so that the mold for the frame is made from the tank line to the main deck.

Three molds are made for the frame, viz., one for the web, shell and inside rivet holes.

Two molds are made for the hopper stiffener, one for the hopper plating and another for brackets on inside flange.

The channel braces are all laid off with two molds, one for the web, marking the rivet holes for frame and bracket plate connections, and the

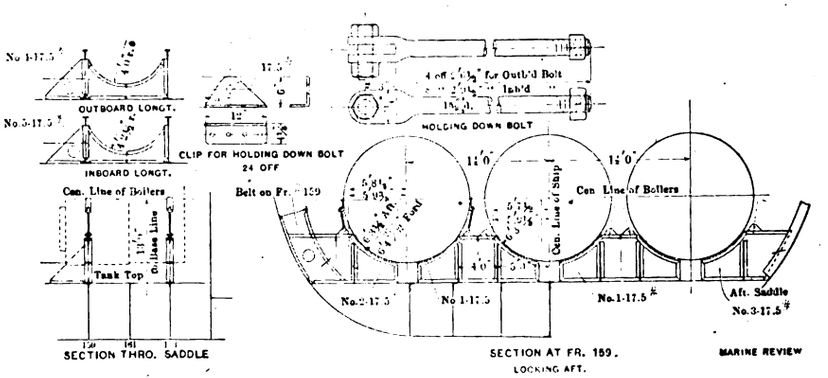


FIG. 11.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

other for the rivet holes in the intercostal flanged plate and channels. Four molds are necessary for the bracket plates in this space in the hopper. One mold for the bottom bracket in the hopper, one mold for the two bracket plates for the braces, one mold for the top bracket connecting angles and channels to top of hopper or main deck, and a tee-shaped mold for the two top angles of same.

The fore and aft channels are made from one mold, the frame holes being gaged on same. One mold does for the intercostals, being tee-shaped, one mold for the end brackets, and tee-shaped mold for the angles.

The top side framing between the web frames and running from the tank top to main deck line is composed of main frame, hopper stiffeners, plate brackets, braces, channel stringers, stringer intercostals and clips, all of which are put together on the ground and riveted. Fig. 7 shows the top side framing between the belts as it appears when riveted ready to be erected in place on the ship.

The top sides of the web frames are laid out along with the top side framing and erected in rotation with the framing. The web frames are all riveted on the ground with the exception of the lower part of the plate which is riveted to the plate floor, the bracket angles and the lower part of the face angle which runs down and riveted on to the girder plate.

One mold for the web plate and two for frame and face angle are required to mark off the webs between the tank top line and the top of hopper.

With the erecting of the side framing the hopper plating and shell plating on side is erected. The side shell plating is laid out with strips as it is found more convenient in taking care of the sheer on the plate edges. The strips used for the side shell plating are four in number, viz., seam frame, intercostal, and lap butt mold. A level line is put on the plates and the frames and butts are squared in from same and sheer heights measured.

The frame strips are applied to the frame lines and the rivet holes marked from same. On the frame strips the width of the plates are scratched on which checks the plate edges and guards against any error which may occur in locating the points for the plate edges.

On the points for the plate edges the same mold is sprung to the desired curvature and held in place with clips until the rivet holes are all marked.

The line of intercostals is also marked upon the frame strip and the intercostal strip is held to same until the rivet holes are all marked.

Marks are so arranged on all the strips used for this work that they must all agree and leaves little chance of error in doing this work.

Fig. 8 shows bulkheads and details as well as the transom framing.

sides. The holes in the flanges of the angles are arranged to come between each other so that all that is necessary is to move the mold on the opposite flange half the rivet space so that the same mold is used for both flanges of the angle. The wrecking well comes on the foreside of this bulkhead which is also laid out and erected with the bulkhead.

All this bulkhead is completed from the mold loft so that it is not neces-

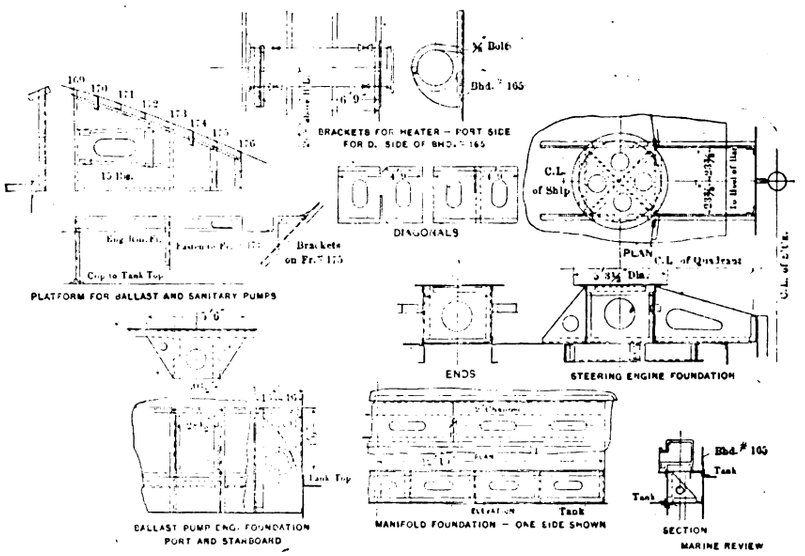


FIG. 12.

Bulkhead No. 16 is the collision bulkhead, and is laid off from the mold loft.

This bulkhead is punched and put together on the ground, riveted and erected in one piece on the ship. Molds are made for one-half of the bulkhead so that two pieces are marked from each mold for the plating. The holes are so arranged in the stiffeners that one mold is used for marking all the stiffeners. Deck and tank top angles where the rivet spacing changes a mold is made for one side of the vessel. For stringer brackets one mold serves the purpose of marking all the brackets and clips. No. 29 bulkhead is plated vertically, one mold serving the purpose of marking all the plates between the hoppers. The plates are all lapped and the vertical stiffeners come on same as well as between the seams, so that two molds are necessary for the vertical stiffeners. One one-half mold marks all the horizontal stiffeners and one-half mold for each deck and tank top angle.

One mold is made for the bulkhead connection to the hopper, which serves the purpose of marking both

sary to mark anything for same from the ship.

No. 29 bulkhead above spar deck is also completed from mold loft; also the partitions and No. 18 bulkhead. A mold is made for each plate for one side of the vessel and half of the deck angle, but one stifferer mold serves the purpose to mark all stiffeners.

Screen bulkheads Nos. 71 and 111 are practically the same so that one mold is all that is needed to mark all the plates between the hoppers. The seam of the plate being on the center line two plates can be marked without any change being made on the molds. The camber of the beam and tank top makes it necessary to get the bevel of each plate after leaving the center of the ship. This is drawn on the mold so that all the fitter has to do is to measure from the line on the mold to the edge touching the tank top and spar deck.

This distance is what is most convenient.

Bulkhead No. 151 is a watertight bulkhead and forms the fore end of the coal bunker space. This bulkhead is all laid out from the mold loft

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

floor similar to the others, even to the drain box on same.

Bulkhead No. 155 forms the after end of the bunker space and is all laid off similar to the others from the mold loft, including the air ducts.

Bulkhead No. 165, the forward end of the engine room, is also completed as per plan from the mold loft.

Bulkheads Nos. 181 and 186 are laid out like the others and riveted on the ground before erecting.

The transom framing here shown is also laid out and completed ready for erecting on the vessel.

This information is usually supplied with the offsets as a help in fairing up the ends.

Fig. 9 shows plans of main deck, spar deck, inboard profile and details.

The inboard profile shows the vessel cut down through the center line, being a very important plan and necessary before commencing to lay out any work above the tank top.

The spar deck plan shows the plating and general arrangements on same.

One mold is used for the outer stringer for the straight part of the vessel, after which a mold is made for each plate on one side of the vessel, two plates being marked off same. The holes for the timberheads are punched in the plates, also holes for mooring chocks so that they are put in place and bolted down without any drilling on the vessel. One mold serves the purpose of marking all of the inner stringer and one mold for the seam straps.

One mold is used for the straight part of the stringer angle and molds are made for angles at ends, as it is necessary to have the shape of the end angles, which have to be bent either at the furnace or cold press. Two molds serve the purpose of marking all the deck plates between the hatches at the after end; a mold is made for each plate on one side of the vessel.

All scuttles and deck engine foundations are looked out for to save drilling for same on vessel.

The beams are laid out with molds for deck holes, beam bracket and clips for deck girders.

Two molds serve the purpose of marking all the hatch coamings to the deck, one fore and aft and the other for half the width of the ship. Two molds are used for the corner clips and one mold for the cleats, which completes all the molds necessary for the hatches.

The detail of the hatch is shown along with the gunwale bar strap and stanchion pockets inway of hatches.

Details show the riveting on spar deck and location of deck engines and fastenings. The spar deck forward stops at frame 29, the front of forecastle.

The windlass deck runs from frame 29 to the stem and is laid off with molds, one mold being made for each plate on one side of the vessel and marking two plates from same. The two stringer angles are laid off from molds, likewise all the shell lugs.

The forecastle deck plating is laid off from the mold loft, one mold serving the purpose of marking sixteen (16) plates, molds being made for the balance and stringer angles.

The forecastle beams are laid off with one mold for the deck holes and another for the beams knees in the usual way.

The main deck stringer forming the top of side tank is laid out with one mold along the straight part of the vessel and beyond that a mold is made for plates on one side of the vessel which serve the purpose of marking two plates from same. One mold serves the purpose of marking all the inner angles, the holes being of uniform pitch and zigzag.

The stringer angle likewise is marked from one mold throughout the tank, molds being made for one side of the vessel where it is necessary to furnace or cold press same. The main deck is plated over at the ends, the after end forming the top of after peak tank. At this end a mold is made for each plate on one side of the vessel and angles and shell clips.

The main deck forward forms the top of the fore peak tank and dunnage room floor. Four plates are marked from one mold for the dunnage room floor but for the balance of plates and angles a mold is made for each piece for one side of the vessel.

The foremost part of the main deck also forms the floor for the chain locker which is also completed from molds and erected along with the deck.

The platform in engine room and engine deck are also laid off, a mold being made for each piece for one side of the vessel.

All manholes and scuttles are completed with these decks and flats so that no drilling is done on the vessel.

Fig. 10 shows the plan of engine and thrust foundations, which are all laid off from the mold loft floor, molds being made for each piece for one side of the vessel and duplicated where possible.

Fig. 11 shows boiler saddles, which are all laid off and completed from molds.

Fig. 12 shows plan of the miscellaneous foundations, which are all completed from molds.

Molds are made for one piece and duplicated where possible.

OIL FOR THE NAVY.

Bids were opened at the navy department last week for supplying lubricating oils for the use of the navy. The proposals were divided into five classes, according to the place of delivery required by the specifications.

Under the first classification the oil is to be delivered at the following navy yards and stations: Portsmouth, Boston, Brooklyn, League Island, Washington, Norfolk, Charleston, Pensacola and naval stations at Key West, New Orleans, training station at Newport, naval station at New London, naval academy at Annapolis and U. S. S. Wolverine at Erie, Pa., in all 360,000 gallons of different kinds of oil. Upon this class the bidders were as follows: E. F. Houghton Co., Philadelphia, $105,665; New York Lubricating Oil Co., New York, $101,675; W. C. Robinson & Sons Co., Baltimore, $110,286; Vacuum Oil Co., New York, $86,275.

Second class, to be delivered at Mare Island, Puget Sound yards, naval training station, San Francisco, naval station Honolulu and at San Diego, Cal., San Francisco, Portland, Ore., Tacoma, Wash., and Seattle, Wash., in all 145,000 gallons of different grades. On this class the bidders were: New York Lubricating Oil Co., $40,775; Seaboard Oil Co., Seattle; Vacuum Oil Co., $38,780.

Third class, to be delivered at naval station, Cavite, and to vessels at Manila, Hong Kong, Shanghai and Yokohama, in all 145,000 gallons of different grades. The bidders were: E. F. Houghton Co., $42,315; New York Lubricating Oil Co., $40,775; Vacuum Oil Co., $40,800.

Fourth class, to be delivered at Havana, Santiago, Guantanamo and San Juan, in all 72,000 gallons of different grades. The bidders were: E. F. Houghton Co., $24,290; New York Lubricating Oil Co., $20,335; Vacuum Oil Co., $19,355.

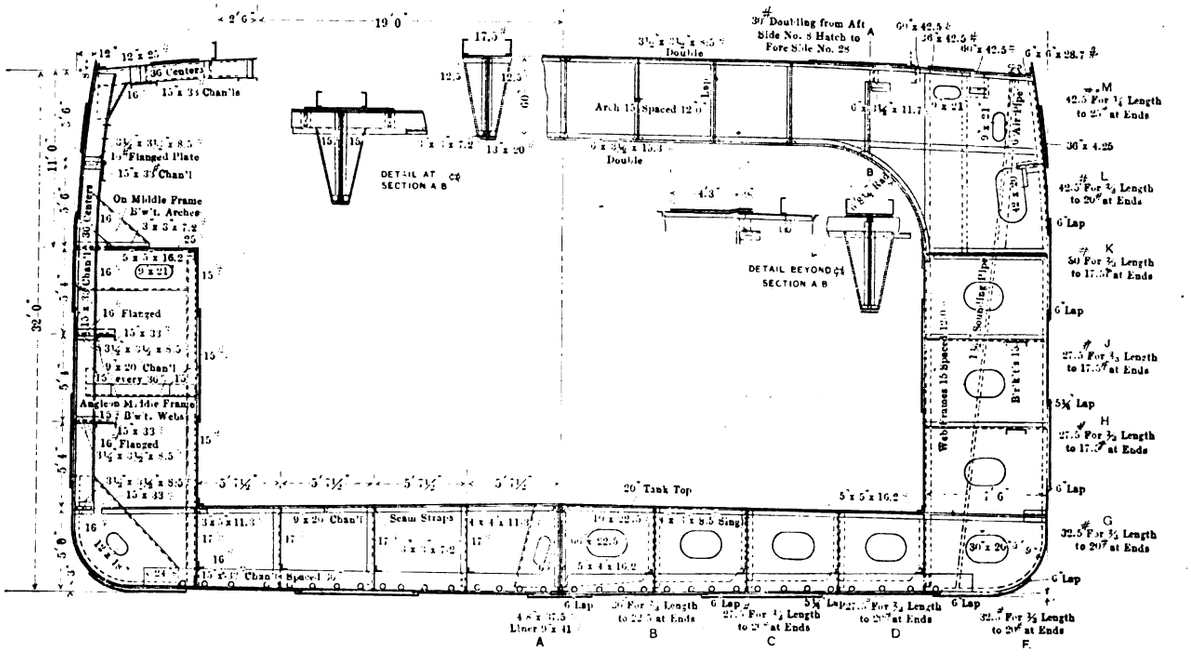
Fifth class, to be delivered as may be designated, 72,000 gallons in all. The bidders were: E. F. Houghton Co., $21,133; Vacuum Oil Co., $21,791.

The tug Marion, built at the Heath ship yard, Tacoma, Wash., for the Norway Packing Co., has been completed and placed in commission in northern waters.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

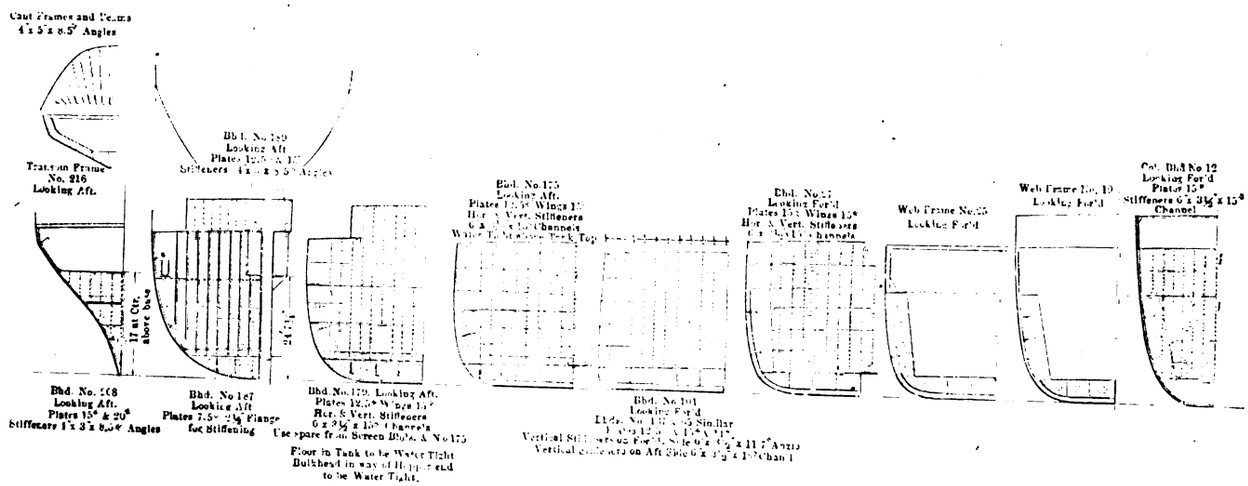
BULK FREIGHTER WILLIAM M. MILLS.

It is interesting to note that the steamer William M. Mills and her sisters, Le Grand S. De Graff and William B. Kerr, are the largest vessels on the lakes, exceeding the Thomas F. Cole by 1 ft. 7 in. All three are now in commission, bringing record cargoes into the ports they touch and testifying in other ways to the progressiveness and nervous energy of the projector, W. M. Mills, who, as his friends relate, put Tonawanada on the map of the United States. The William M. Mills was launched from the Lorain yard of the American Ship Building Co. on July 17 last and went into commission on Aug. 18. Like her sister, she is 607 ft. over all, 585 ft. keel, 60 ft. beam and 32 ft. deep. Her engines are of the triple expansion type with 22¼ in., 37½ in. and 65 in. diameter of cylinders, and a common stroke of 42 in. Her boilers, two in number, are 15 ft. 4½ in. diameter and 11 ft. 6 in. long, with three 48 in. Morrison corrugated furnaces each, and are built for 200 lbs. steam pressure and fitted with Ellis & Eaves patent system of induced draught. The furnaces are equipped with Sturrock patent cast iron bridge walls. The electric light plant consists of two direct connected 15 K. W. engine and generators of General Electric make of about 540 16 c. p. capacity.



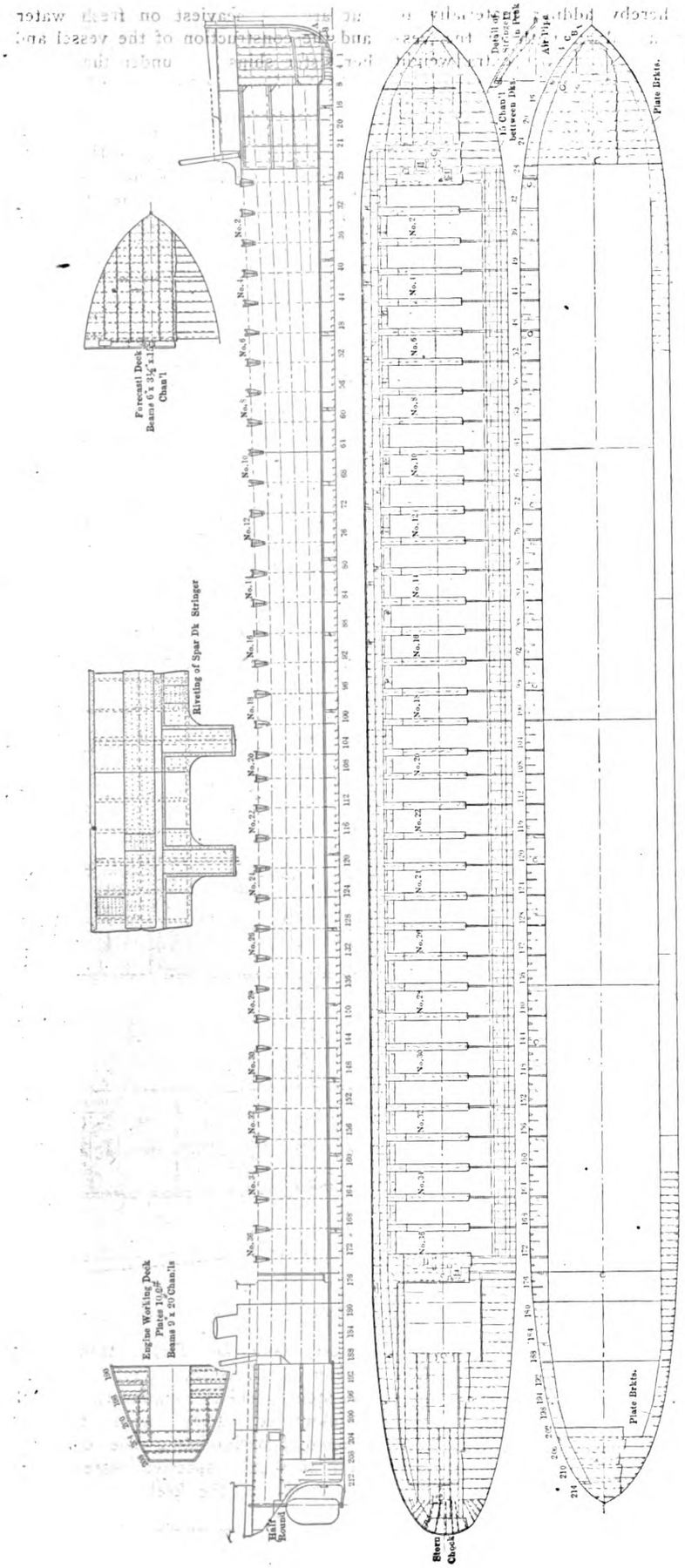
MIDSHIP SECTION OF STEAMER WILLIAM M. MILLS.

In addition to the Globe steering engine, which is located aft in the engine room and operated by the Brown telemotor, the vessel is equipped, as are all the steel steamers operated by W. M. Mills, with the Akers emergency steam steering gear, which is located aft on the

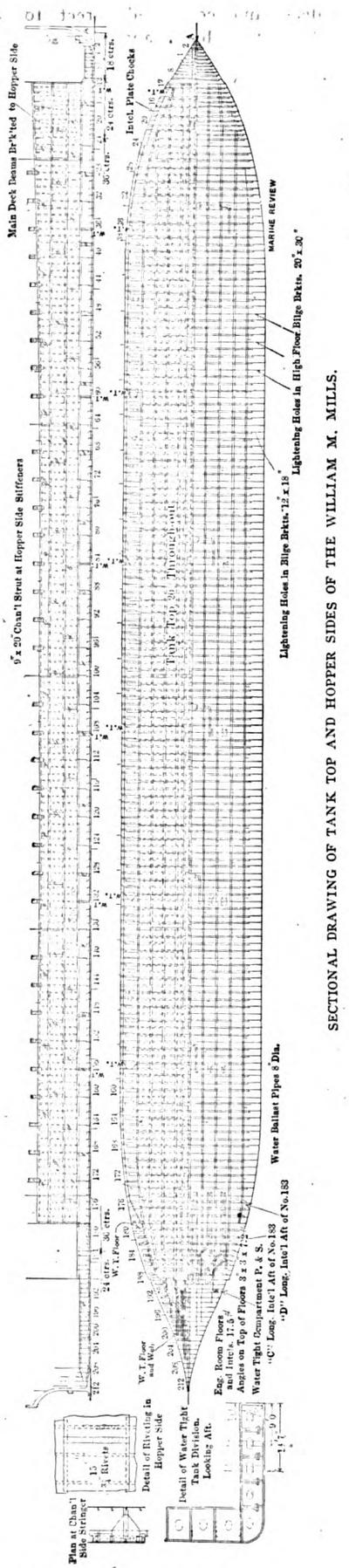


DETAIL OF BULKHEADS OF STEAMER WILLIAM M. MILLS.

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



DECK AND PROFILE PLANS OF THE WILLIAM M. MILLS.


Main Deck Beams Br'k'ted to Hopper Side
9" x 20" Chan'l Strut at Hopper Side Stiffeners
Intcl. Plate Chocks
Lightening Holes in Bilge Brkts. 12" x 18"
Lightening Holes in High Floor Bilge Brkts. 20" x 20"
Water Ballast Pipes 8" Dia.
"D" Long. Inte'l Aft of No. 183
"C" Long. Inte'l Aft of No. 183
Water Tight Compartment P. & S.
Angles on Top of Floors 3 x 3 x ½
Eng. Room Floors and Intcls. 17.5
W. T. Floor and Web
Detail of Riveting in Hopper Side
Detail of Water Tight Tank Division. Looking Aft.
Plan at Chan'l Side Stringer
MARINE REVIEW

SECTIONAL DRAWING OF TANK TOP AND HOPPER SIDES OF THE WILLIAM M. MILLS.

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

main deck and connected direct to the rudder stock by means of a separate cast steel geared quadrant and a specialy designed worm shaft.

As shown by the midship section, the vessel is built on the hopper and girder system, which admits of a cargo hold 447 ft. long without obstruction other than three screen bulkheads fitted for convenience in carrying grain, with a total capacity for 514,050 bu. of wheat.

Like her sister ships she will carry 12,380 tons of ore which is equal to 13,866 tons of coal on a 20 ft. draught. Her hoppers, which are 7 ft. 6 in. wide, extend from the collision bulkhead to the after end of the coal bunker and are divided by the center keelson and six division bulkheads into fourteen water-tight compartments. The lower ballast tanks, 5 ft. 6 in. deep, extend aft under the boilers and engines to the well at the aften end of the engine room, and this, with the addition of the fore and after peaks, makes a fotal of seventeen water-tight compartments. At the forward end of the cargo hold there is fitted an auxiliary collision bulkhead extending from the lower tank top to the main deck and connected to the hopper sides.

Between the forecastle and boiler house there are 36 cargo hatches, spaced 12 ft. centers and fitted with patent steel plate telescope covers, and the bulkheads are so located that every foot of hold space is available to the clam shells, and to further facilitate the work of the clams the stiffeners on all the bukheads in the cargo space have been fitted vertically and securely connected to the lower tank top where all ore pockets have been avoided. For convenience sliding plate doors have been fitted on the screen bulkheads between the vertical stiffeners so that the bulkheads are of the greatest possible strength.

There is capacity for 7,000 tons of water ballast in the tanks and hoppers, and to take care of this the vessel is equipped with a pumping plant consisting of two 8 in. x 12 in. x 14 in. duplex pumps and two 14 in. centrifugal pumps with a double manifold connected complete to all the compartments by separate suction and filling pipes 8 in. diameter, and the 7,000 tons of ballast can be discharged overboard in three hours.

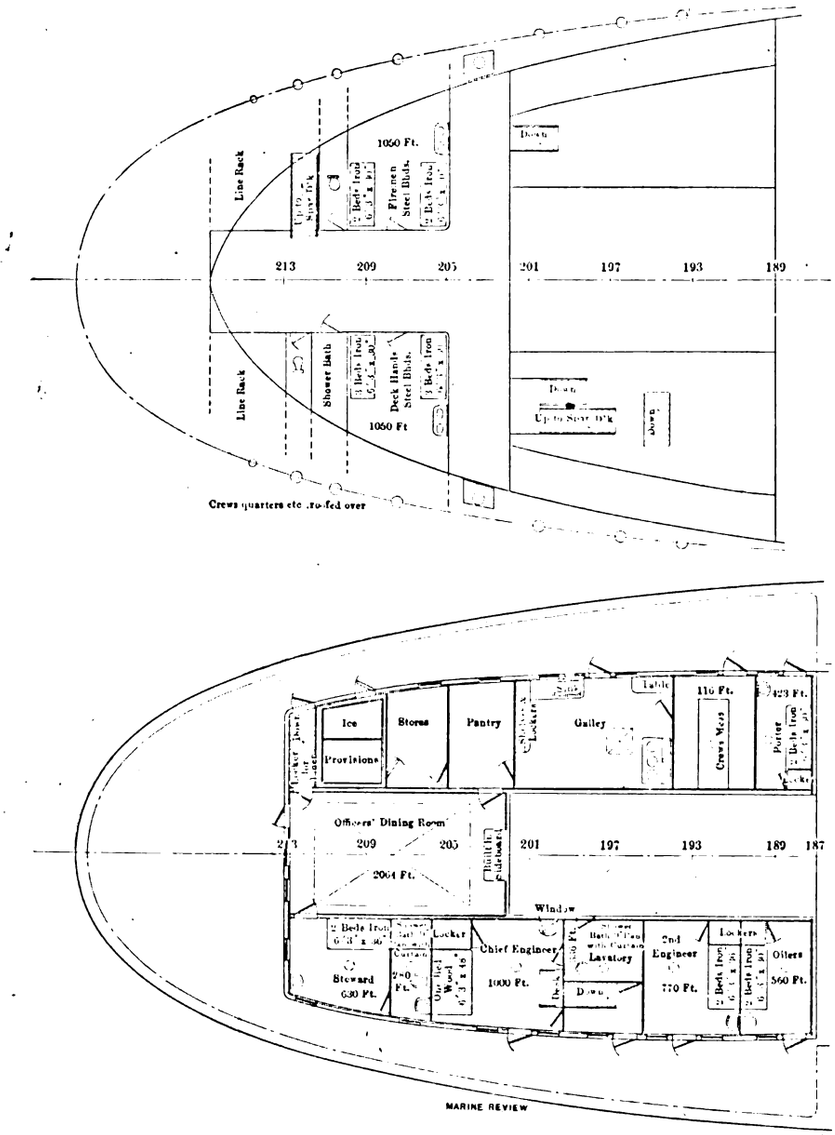
The hopper sides as shown in the section are straight and with the aid of the outboard longitudinal, form a girder from the bottom shell plating to the main deck height, a depth of 21 ft., thereby adding materially to the longitudinal strength of the vessel. The arches are of extra weight and depth, and are fitted with an adequate number of heavy flanged plate brackets. The topside strakes, sheers and spar deck stringers are also extra heavy and well secured by wide seam straps and riveted with 1⅛ rivets.

The passenger and crew quarters forward are on the spar deck level and the deck hands and firemen are located on the main deck aft and provided with every convenience.

The windlass is of the Globe pattern, and deck engines including the deck engine aft of the cabin are all of the American Ship Building Co.'s latest pattern and equipped with 1⅛ in. steel wire cables.

The scantlings of the hull throughout are the heaviest on fresh water and the construction of the vessel and her sister ships was under the supervision of Nacy & Hynd, of Cleveland, O., and classed + A. I. for 25 years in the American Bureau of Shipping.

The masters and engineers of the vessels are: Steamer William M. Mills, Capt. John R. Herson; chief engineer, Edward Cottrell; steamer William B. Kerr, Capt. G. W. Honner; chief engineer, Guy De Puy; steamer Le Grand S. DeGraff, Capt. Thomas Deringer; chief engineer, Frank Trinkwalder. They were on the ground superintending the construction of their respective vessels from the laying of the keel.



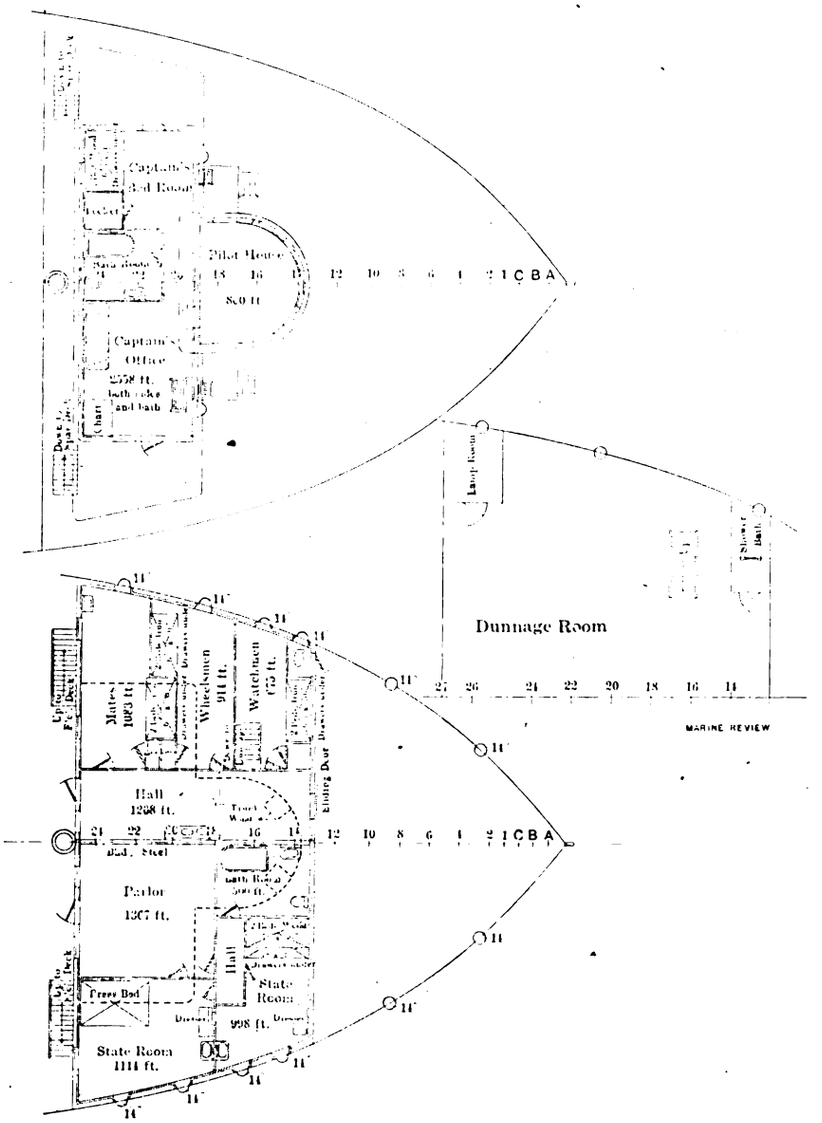
CREWS QUARTERS AFT ON THE STEAMER WILLIAM M. MILLS.

The life of the North Atlantic iceberg is often 200 years.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

AKERS EMERGENCY STEAM STEERER.

The Akers emergency steam steering gear is only installed in a ship to be used as its name implies, but really is a complete steam steering gear, entirely independent in every feature of the regular gear from the quadrant to wheel stand on top of the pilot house. Was invented and patented by Capt. E. C. Akers, who has had over 20 years' experience with all kinds and classes of steering gears.



CABIN PLAN OF STEAMER WILLIAM M. MILLS.

It consists of a separate quadrant keyed on rudder stock and is in the form of a gear or cog wheel which meshes into a pinion, supported on a vertical shaft with a clutch suspended above pinion instead of the common method of chain from quadrant to steering engine. When the regular gear is in operation the pinion is an idler and turns at every movement of the rudder. The pinion and clutch shaft has at its lower end a very peculiar worm gear which in connection with the worm is attached by means of a counter shaft to the Akers engine. This worm gear is peculiar as the ordinary worm gear is designed to lift a load and hold it, the worm being the driver, and the gear the driven. In this set of worm gears the gear can be either the driver or driven.

When it is necessary to use the Akers gear a crank is turned on the pilot house. The one operation releases the clutch and by means of trip hooks on each of the chains they are dropped down free of the regular quadrant. Should this operation take place when the ship is in a sea and one of the chains had parted or broken the rudder would be swinging or flopping. Steam being on Akers' engine all the time, this train of spur and worm gears transmits the shock when clutch is thrown in, to the pistons of engine, and the steam cushions the blow and checks or catches the rudder. In the Akers method of transmission the act of operating valve of steering engine from the pilot house is a very simple and positive arrangement. A vertical shaft runs down from wheel stand to a set of bevel gears under the spar deck, which connects by means of a longitudinal shaft and a pinion with a long rack, carried on ball bearing rollers. On one end of rack is connected one inch extra heavy gas pipe. This pipe runs on ball bearing sheaves through the whole length of ship, and at the stern connects with a similar rack and pinion, and another set of bevel gears on throttle shaft of engine. You turn wheel to port, you pull this long pipe forward, and to starboard, you push it aft. The pipe only travels about 18 in. in both the forward and aft movement.

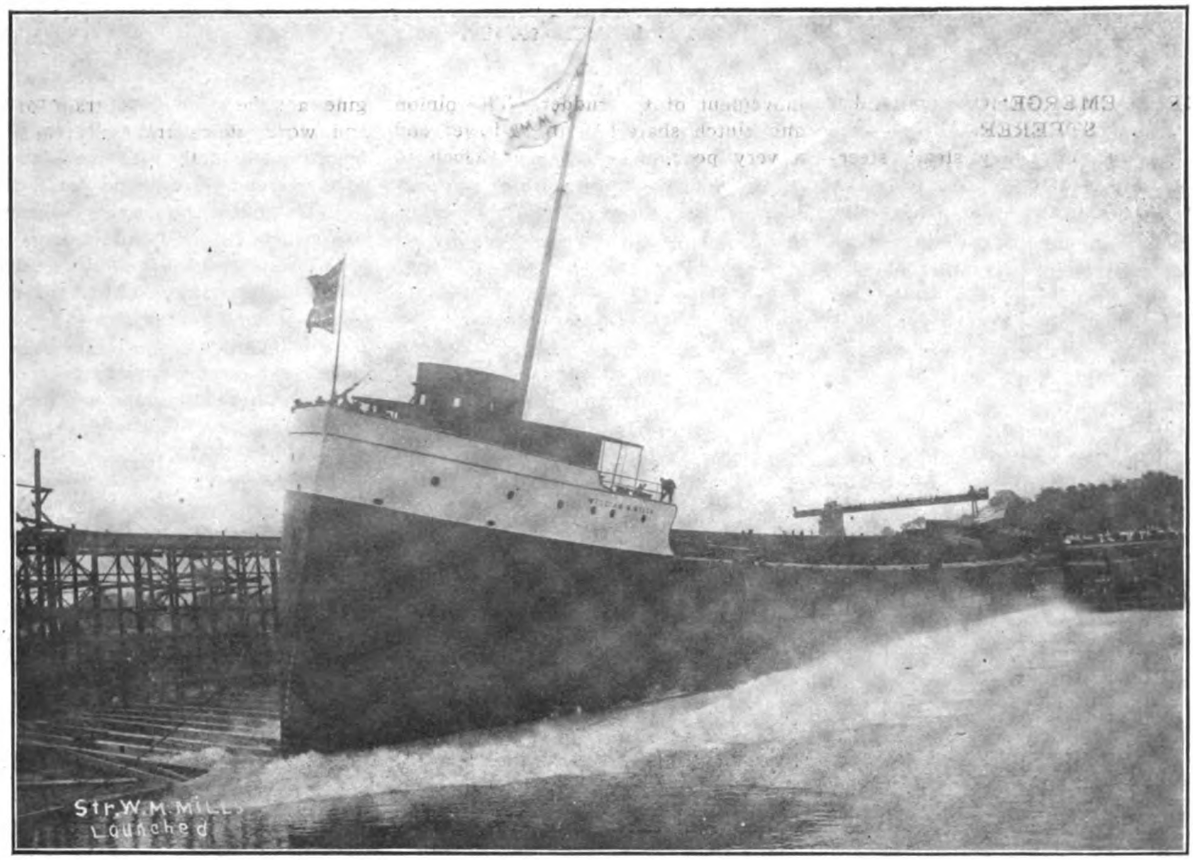
By having this rack three times longer than actually needed, it makes no difference what position the regular quadrant is in when Akers gear is thrown in. The rudder can be amidship or hard over.

The change from regular gear to the Akers can be made in 10 seconds by the officer on the bridge. When the man at the wheel says, "Something wrong with steering gear," it is only a matter of practically touching a button and immediately begin steering with the Akers gear, without any notification to engineer or anyone else. The Akers gear is the only device of its kind in the world, and has met all requirements and done everything its makers claim. The fact of its having been installed in all the boats built by Mr. W. M. Mills in the past two years is a recommendation that speaks for itself.

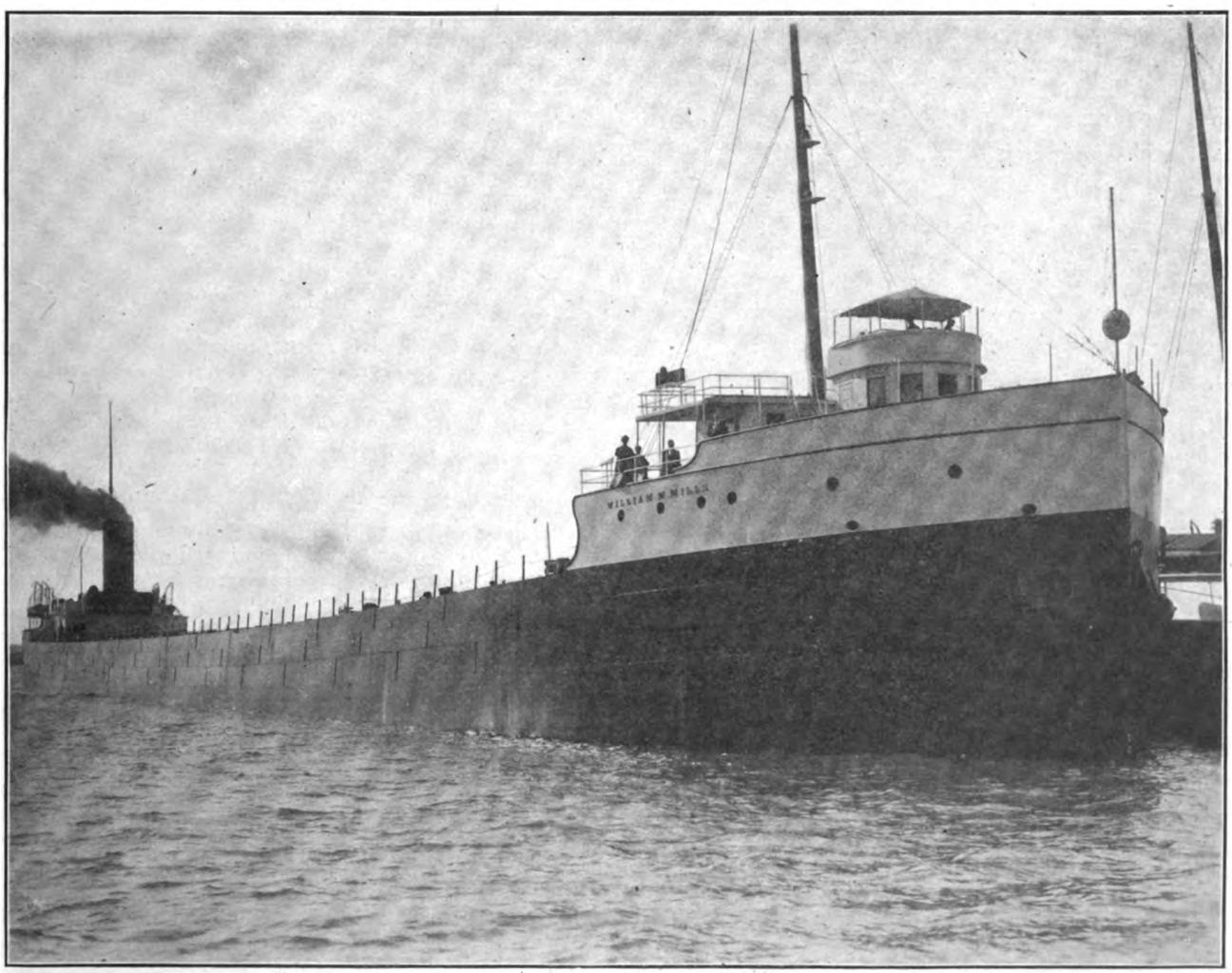
The new tug General Hubbard has completed her fitting out and has left on her long voyage to the Pacific. She was built by the Neafie & Levy Ship & Engine Building Co., Philadelphia, Pa.

King & Winge, Seattle, Wash., have recently repaired the government steamer Peterson and the snag boat Skagit. This company is to remove its quarters inside of Aliki Point during the coming winter. They have acquired 850 ft. of water frontage there and will erect four sets of ways, thus enabling them to handle a much greater amount of work than formerly.

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



LAUNCHING OF THE WILLIAM M. MILLS AT THE LORAIN YARD OF THE AMERICAN SHIP BUILDING CO.

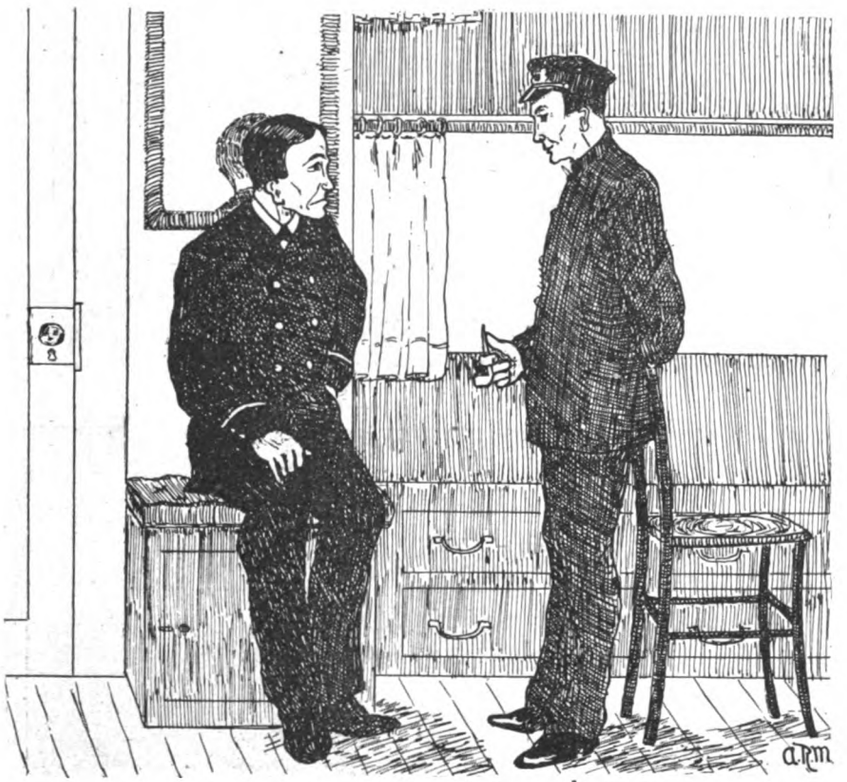


THE WILLIAM M. MILLS ON HER MAIDEN TRIP.

Generated on 2024-08-28 14:04 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

"IN THE MERCHANT SERVICE."

After a man has made one or two futile efforts to recline in divers positions on his settee, especially one of those elegant-looking hog-backed contrivances, and finds that dozing off and the consequent relaxation of vigilance has resulted in his awakening with his head hitting the deck and various parts of his anatomy sprawling around the limited accommodation of his room, he submits to the inevitable and climbs into his bunk. There, if a 'thwartship bunk, he can



STEVENS HAD CORNERED AN UNWARY JUNIOR.

by packing the ends of the bunk with a valise (and a few other trifles) reduce the travel of his form to a minimum, and, beyond a periodical rush of blood to the head, should be fairly comfortable. Or, if the bunk should happen to be a fore-'an-after, he can wedge himself between the bulkhead and the lee-board by doubling up with his knees in the vicinity of his chin and slumber sweetly through a gale.

No two ships take heavy weather alike, and no two engineers take exactly the same view of it, either. Everything is in the getting used to it, and so long as a man isn't really miserable he ought to be happy.

Stevens, third engineer of the Jamaican, wasn't happy. He didn't see why the weather should hold out so darned long—didn't see why there should be any heavy weather this time of the year, in fact, and wondered how some of the other engineers could look with such a placid eye on the prospect. It didn't seem to strike him that his incessant growling—especially at the weather—could jar his shipmates, who smiled pityingly upon him. The sea-farer loves a kicker—a good, hearty kicker—but the chronic growler he has no use for. But Stevens had cornered an unwary junior in said junior's cabin, and was relieving his mind about things in general, much to the edification of the junior, no doubt, considering he was making his maiden trip across.

"Some of you young fellows try to make yourselves think that you enjoy this kind of weather, but, when you have been at this game as long as I have, you'll quit throwing a bluff and look as you feel. Of course, the Jamaican is a darned old tub at the best, but now you can see for yourself what she will be like during the winter. From October to April, or maybe May, it will be wet decks, wet boiler rooms, wet quarters, and wet feet. You'll see half of the Atlantic coming down the fiddleys and air shafts. Your watches below will be spent in periodically-flooded-out boiler rooms, and, if she happens to ship a sea when your fires are being cleaned, you'll see trouble. And it's bad enough to be wading around in a mixture of coal and water a foot deep, but when barrows and ash buckets and fire-tools are sliding around in the general wash you'll find yourself doing some mighty lively stepping to keep your limbs intact."

The junior, Higgins, nodded cheerfully and said he "supposed it was all in a lifetime." Stevens spat disgustedly, looked from the port on the stormy black sea, and continued his lament.

"That is the time o' year when your bilges begin to give trouble, too. Your tank tops will be awash and strainers choked and you'll put in a couple of hours each watch wallowing around under the boilers with a hand lamp. You see, when she ships it down the boiler rooms, there is always some wise guy helps the water off the foot plates by raising one of them. This ingenious move certainly lets water run off, but all the loose small coal travels with it. As it is usually a fireman or coal-passer who takes it upon himself to help along the work in this manner, what you have to do is to hand him a biff on the head—good and hard, too."

"Sure thing," said Higgins, brightening at the prospect.

"Were you on deck when she took that sea, a little ago, for, if you were, it will give you a slight idea of what the old hooker can do when she tries hard. I've seen these quarters awash scores of times—everybody out of bed in all sorts of rigs bailing the rooms out into the alleyway. You'll come off watch some night, and as you pass along the cylinder heads you'll see mattresses, bedding, underclothes, overclothes, and that fancy Panama hat o' yours, perhaps, hanging on the railing to dry."

"Perhaps I won't feel the urgent need of that last-named portion of my attire during the winter trips," said the irreverent junior.

"You'll go to the mess-room, too, good and hungry, but after one or two attempts to make a square meal you'll probably drink your soup and fill up on bread. It isn't likely you're going to sit all day balancing your plate on the rolling chock, watching the soup plate of the man across the table from you, and keeping an eye on the various dishes on the table. When winter comes, and she starts her rolling and diving, I'm going to have one of these motto frames fixed up in the mess-room—'Eat what you can and get out.'"

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

"I'll manage to survive, I guess," ventured Higgins.

"Huh!" snorted the third, "you haven't seen half of the stunts this old derelict can go through. One of these days you'll be sitting eating your dinner, ship rolling nice and easy and everybody happy, when she'll suddenly rise, shake herself, plunge, then go on as usual. When you are through apologizing to your neighbour for the presence of your soup in his lap, you will find, probably, that the contents of the cruet are in yours—pepper, mustard, vinegar and salt, the whole box o' tricks."

"They say it's unlucky to spill salt, anyway," commented the audience.

Stevens ignored the remark and was about to take up the thread of his discourse when the steward appeared to announce dinner. "Well," said the third, gloomily, "I suppose we might go along and try to snatch a bite."

During the course of the dinner the junior looked down the table to where the third sat in dismal enjoyment. The close observer might have noticed that his forebodings of disaster and danger were, for a time, forgotten. In spite of the rolling of the Jamaican an unusual number of plates and other dishes were in his vicinity. The bill of fare was propped against a water bottle, and the third, with his eyes glued thereon, was toying with a healthy-looking plate of victuals.

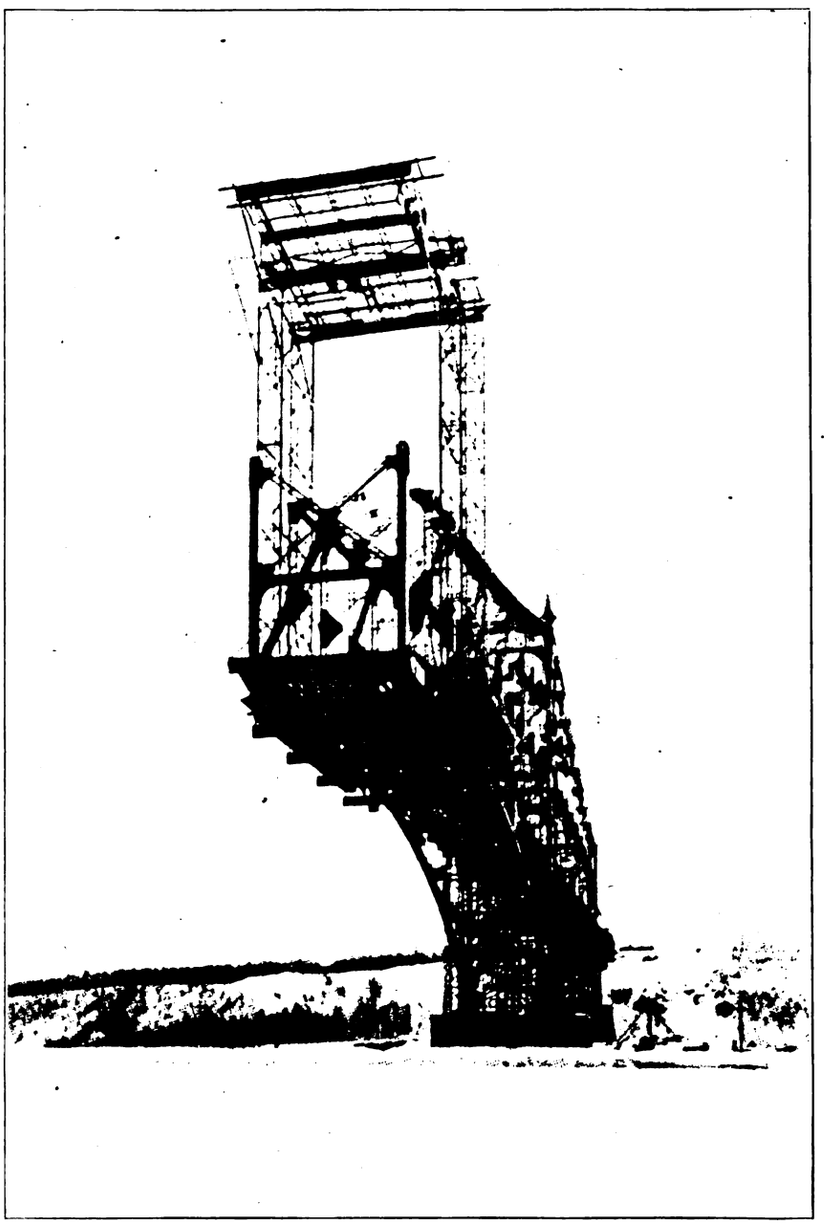
"Some of us would be all right," said Higgins to his neighbor, nodding in the direction of the gloomy one, "if the other things weren't all wrong."

THE "STAND-BY" MAN.

QUEBEC BRIDGE FALLS

The southern half of the bridge being erected over the St. Lawrence river, five miles from Quebec, fell on the afternoon of Aug. 29, causing the death of all but eight of the men engaged at work on it. The latest estimates give a total of 79 lives lost. The cause of the accident is unknown, but it is thought, in some quarters, to be the overloading of the incomplete span with structural materials. The accident occurred at 5:37 P. M., just as the men were quitting for the day. A train load of material had been run out on the bridge when the other end of the incomplete span was noticed to sag. It fell immediately, the remainder of the bridge to the south shore, a distance of about 800 feet, falling in successive sections, carrying away the tower and all steel work.

The bridge was of the cantilever type and had a total length between abutments of 3,220 feet. It consisted of two deck truss, approach spans, each 210 feet long; two anchor spans, each 500 feet long; two cantilever arms, each 562½ feet long; one suspended span 675 feet long, the latter being the longest simple truss span ever built. The central span of the bridge from center to center of main piers was 1,800 feet, the longest in the world. The trusses were of the pin-connected type and had a width, center to center, of 67 feet. The depth varied from 97 feet at the portals to 315 feet over the main piers. The bridge had a clear headway over high tide of 150 feet for a width of 1,200 feet. The total weight of the steel to be used in its construction was estimated at 38,500 tons. The bridge was designed to carry two steam railroads and two electric railway tracks, two roadways and two foot tracks, all on the same level. The bridge was being erected by means of a traveler of the gantry type running outside the trusses on tracks at about the floor level and spanning the highest point of the bridge. This traveler fully rigged with all accessories weighed 1,000 tons.



SOUTH CANTILEVER ARM FROM RIVER.

The engineering work was done in the drafting rooms of the Phoenix Bridge Co., Phoenixville, Pa., which had the contract for the ironwork and detailed the structure. The number of field rivets was cut down to a minimum. However, 550,000 remained to be driven, ranging from ⅝ to 1 inch diameter and up to 7 inches in length.

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

SHIP YARD NOTES.

The Pusey & Jones Co., Wilmington, Del., has recently repaired the lighthouse tender Zizania.

The Burlee Dry Dock Co., Port Richmond, N. Y., has lately fitted the Standard Oil Co. tug No. 8 with a new rudder.

The Morse Dry Dock & Repair Co., Brooklyn, N. Y., has lately repaired the United States army transport Sumner.

The New London, Conn., Marine Iron Works is engaged in the rebuilding of the Connecticut river ferryboat Middlesex.

The Merrill-Stevens Co., Jacksonville, Fla., has completed repairs to the government dredge boats Key West and St. Johns.

The Tietjen & Lang Dry Dock Co., Hoboken, N. J., executed repairs on the Neptune line steamer Rhode Island recently.

The Harlan & Hollingsworth Corp., Wilmington, Del., has recently completed the large steel car float building for the Central Railroad of New Jersey.

The Morgan line steamer Creole has been at the yard of the Morse Dry Dock & Repair Co., Brooklyn, N. Y., for repairs and change of propeller.

The Greenport Basin & Construction Co., Greenport, N. Y., recently repaired the schooner Edith Dennis, damaged in collision with a Joy Line steamer.

The steamer Chester, owned by the Norva Land & Lumber Co., was at Roach's ship yard, Chester, Pa., recently for an extensive overhauling.

The steamer Sandy Hook, owned by the Central Railroad of New Jersey, has lately been repaired in the dry dock of James Shewan & Son, New York.

M. M. Davis & Sons, Solomon's, Md., launched a combination tug and water boat at their yard last month for the American Towboat Co., Philadelphia, Pa.

The Greenport Basin & Construction Co., Greenport, N. Y., has a contract for the construction of a Long Island Sound oyster boat for the firm of Mills & Lowndes.

The ship yard of J. H. Price at Bandon, Ore., which was recently swept by a disastrous fire, will be rebuilt. Three vessels were burned, all being steam schooners.

The old Higgins repair yard at Bayonne, N. J., has been acquired by Deibert & Patterson, both men of practical experience, gained in the Staten Island ship yards.

The ferryboat Nassau, building by the Harlan & Hollingsworth Corp., Wilmington, Del., for the Department of Docks and Ferries of the city of New York, was launched last month.

The Pelly Dry Dock Co., New York, recently launched a dry dock capable of lifting a vessel of 1,000 tons, at its yard at 29th street, South Brooklyn. This is the sixth dock of the company.

The British Columbia Marine Railway Co., Esquimalt, B. C., has completed the repairs to the steamship Northwestern, which was wrecked at La Touche, Alaska, some months since.

The steam dredge Gen. Abbott, of the United States quartermaster's department, has been undergoing general repairs to hull and machinery at the yard of James Shewan & Sons, New York.

The next launching which will occur from the yard of Crawford & Reid, Old Town, near Tacoma, Wash., will be that of the steam tug which is being built for Arthur Weston, of Olympia, Wash.

The Lindstrom Ship Building Co., Hoquiam, Wash., has about ready for launching the three large rock barges for use in the government work at Damon's Point. One barge has already been completed.

The Fore River Ship Building Co., Quincy, Mass., has been awarded contract for repairing the hull and machinery of the tug Robert S. Bradley, owned by the Bradley Fertilizer Co., and work has been started.

The new steam schooner Bandon, which was built at Price's Coos Bay yard for the A. F. Estabrook Lumber Co., of San Francisco, Cal., has had her machinery installed at Seattle. She was launched July 2.

The repairs to the steamship Ohio, which was wrecked in Alaskan waters some months ago, have been completed at Quartermaster Harbor, Wash. The work was done by the Commercial Street Boiler Works, Tacoma.

The Tietjen & Lang Dry Dock Co., Hoboken, N. J., executed repairs upon the Hudson River Day line steamer Hendrick Hudson last month. The steamer's rudder was damaged and it was necessary for her to go into dry dock.

The schooner R. C. Slade, owned by S. E. Slade, San Francisco, Cal., has been given a thorough overhauling and repairing preparatory to her undertaking a voyage to Tasmania. The work was done by the Vulcan Iron Works Co., Aberdeen, Wash.

The United States torpedo boat Perry has been at the Puget Sound navy yard, Bremerton, Wash., receiving minor repairs. An air compressor was installed and considerable work in the engine room in conection with the piping and tubing has been done.

The E. J. Dodge Co., San Francisco, are building a new steam vessel for the lumber trade between San Francisco and Seattle. The vessel is designed for use also as a general cargo carrier and it is hoped to have her in commission by Oct. 1. She will cost $225,000.

The new steamer Maryland, built by the Maryland Steel Co., Sparrows Point, Md., for the New York, Philadelphia & Norfolk Railroad, has been placed in service between Cape Charles and Norfolk for the purpose of accommodating the traffic incident to the Jamestown Exposition.

After the completion of the repairs to the Pacific Mail Steamship Co.'s liner Manchuria at the yard of the Union Iron Works, San Francisco, Cal., the Mongolia, of the same line, went into dry dock to make permanent repairs to the damages sustained in having gone ashore last year.

The Nilson Yachtbuilding Co., Ferry Bar, Baltimore, Md., have launched the power boat Petrolia No. 3 for the Standard Oil Co. This vessel is 80 ft. in length, and 16 ft. in width. She is equipped with a 100-H. P. Standard gasoline engine and is expected to attain a speed of 12 miles an hour.

The steamer William Chisholm, with the barge Mary B. Mitchell in tow, arrived at the yard of the Newport News Ship & Engine Building Co., Newport News, Va., from Cleveland, O. These former lake vessels are to ply in the coastwise coal trade and were fitted with the necessary equipment.

The Old Bay line freight steamer Gaston has been at the works of the James Clark Co., Baltimore, Md., for extensive repairs to her machinery.

William E. Woodall & Co., Baltimore, Md., repaired the steamer Choptank, owned by the Baltimore, Chesapeake & Atlantic Railway Co, Baltimore, Md., last month.

The Harlan & Hollingsworth Corp., Wilmington, Del., have delivered to the city of New York the municipal ferry boat Gowanus, recently completed at their yard. This vessel is a sister ship of the Bay Ridge, which was lately given her trial trip and both vessels will ply in the South Ferry and Thirty-ninth street service.

The new steamer Whidby, owned by the Island Transportation Co, Coupeville, Wash., has been completed by her builder, Capt. H. B. Lovejoy of Coupeville. The steamer is to run from Seattle and Everett to Coupeville. She is 130 ft. in length, 22 ft. beam and is equipped with triple expansion engines with cylinder diameters 11, 17 and 28 in. by 16½ in. stroke. Steam is supplied by a Taylor boiler allowed 300 lbs. pressure. The Whidby is an oil burner and it is expected that she will attain a speed of about 17 miles an hour.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

EPITAPH TO A THIRD ENGINEER.

One of the speakers at a recent trip had intended to recite the following lines to the company, but his courage failed him, and, instead, he quietly handed the manuscript to a press representative. The lines are entitled "Epitaph to a Third Engineer":

When the last crank and crosshead's been tightened,
And the Third Engineer laid to rest,
And his tools all rusted and broken,
Divide what you think are the best.
No red hot cranks or second pranks
Will there the Third annoy,
But in robes of white, a shining light,
Somebody's fair-haired boy.
No rods to swing, no gear to sling,
Nor bottom ends to tighten,
No glands to pack, no nuts to slack,
No firemen to frighten;
But on that bright and happy shore,
Beyond this vale of tears,
Where the Seconds cease from troubling,
And there's no "Chief Engineer,"
So leave him alone in God's Acre,
He died in his own beliefs
That Heaven's reserved for the Juniors,
And Hell's set apart for the Chiefs.

—Glasgow *Evening Times.*

THE SONG O' STEAM.

"Romance! These first-class passengers they like it very well,
Printed and bound in little books; but why don't poets tell—
I'm sick of all their quirks an' turns—the loves and doves they dream,
Lord, send a man like Robbie Burns to sing the song o' steam!"

—*Sailors' Magazine.*

SHE DIDN'T REVERSE IN TIME.

There's a nautical expression you will hear on every ship,
'Tis the skipper's called the "Old Man" though the down's scarce on his lip,
The younger that they are, they think the less they have to learn
About the various fixings from the bow right to the stern.
When the ship has made a record run, due to the powers below,
To take the credit to themselves most skippers are not slow,
But when they wander off the course, mistake a light or two,
The credit then for distance lost is to the engines due.
When nearing pier or harbor and all on deck goes well,
Some skippers strut about the bridge and all their orders yell,
But should they break a taffrail, 'tis then they swear sublime,
And you hear the interjection, "She didn't reverse in time."
When pier-head piles are broken, through carrying on too far,
Between the bridge and engine-room there rises wordy war,
No matter what the Chief may say, in reason or in rhyme,
The only answer he gets back, "She didn't reverse in time."
One night we crashed into a barge upon the London river,
The shock was felt from stem to stern which caused us all to shiver,
That night in dock when all was snug, our "Old Man" being prime,
A wire he to the owners sent, "She didn't reverse in time."
Then take advice, my comrades, from one who has been there,
Conduct yourselves with dignity, and act upon the square,
The owners of good steamships in almost every clime,
Require more information than, "She didn't reverse in time."—

ENGINEER.

THE SORROWS OF A SKIPPER.

WALLACE IRWIN IN MAY *Century.*

"I hates to think of dyin'," says the skipper to the mate;
"Starvation, shipwreck, heart disease I loathes to contemplate;
I hates to think of vanities and all the crimes they lead to"—
Then says the mate,
With looks sedate,
"Ye doesn't reely need to."

"To conjer up the happy days what careless has slipped by,
I hates to contemplate the day I ups and left me Mary"—
Then says the mate,
"Why contemplate,
If it ain't necessary?"

"Suppose that this here vessel," says the skipper with a groan,
"Should lose 'er bearin's, run away, and bump upon a stone;
Suppose she'd shiver and go down when save ourselves we couldn't"—
The mate replies,
"Oh, blow me eyes!
Suppose, ag'in, she shouldn't?"

"The chances is ag'in us," says the skipper in dismay,
"If fate don't kill us out and out, it gits us all some day,
So many perish of old age, the death rate must be fearful"—
"Well," says the mate,
"At any rate
We might as well die cheerful."

"I read in them statistic books," the nervous skipper cries,
"That every minute by the clock some feller up and dies,
I wonder what disease they gits that kills in in such a hurry"—
The mate he winks
And says, "I thinks
They mostly dies of worry."

"Of certain things," the skipper sighs, "me conscience won't be rid,
And all the wicked things I done I sure should not have did,
The wrinkles on me inmost soul compel me oft to shiver"—
"Yer soul's fust rate,"
Observes the mate;
"The trouble's with yer liver."

NAVAL RATINGS: THE STOKER.

Twenty knots and a call for more,
And the ladders ring to the running feet—
Down, down, down to the black iron floor,
Down to a world of furious heat
Where nothing matters but coal and steam,
And men who work for a spell and swoon
Think of the cool night wind and the gleam
On the deck of a pale half moon.

Slice and feed, and a climb to the main
For a minute's smoke and a glimpse of the stars,
Then four hours' sleep and back again
To clear the clinkered furnace bars—
Back again to the cones of light,
The flyin~ shovels, the white hot glare,
And, if a stoker faints to-night,
Well, the Admiral, he won't care.

Below the glistening water line
He works in a heat that blights and clings;
But he sometimes shouts a joke to his mate,
And sometimes, even, sings.
And, if one day his heart gives out,
Pulling and pushing the slicing rod,
Three rounds of blank, and a prayer or two,
And a quiet grave, thank God!

—*The Speaker.*

PACIFIC NAVAL CRUISE.

Acting Secretary of the Navy Newberry has returned to Washington after 10 days' vacation and a conference at Oyster Bay with the president and Rear-Admirals Evans and Brownson regarding the cruise of the battleship fleet to the Pacific. It will consist of sixteen battleships, six torpedo boats, 9 navy colliers, one repair ship, one water ship, and two supply ships. Upon reaching San Francisco the fleet will be joined by two other battleships, the Nebraska, recently commissioned, and the Wisconsin.

Verbal instructions have been issued to all of the different bureaus and departments of the navy to have the fleet in readiness to sail from Hampton Roads on the long journey by Dec. 1. It is not likely that the start will be made on that day, however, but the day of departure will be some time between Dec. 1 and 15.

According to the schedule arranged the fleet will reach Magdalena Bay some time between March 9 and 19, and it is contemplated to have the ships remain there for about 30 days in target practice. They will thus reach San Francisco some time between the middle and the last of April. Their stay there is indefinite, and no plans whatever have been made for their return trip.

Careful estimates have been made by naval experts and the decision was reached that 100,504 tons of coal in addition to that which the battleships will carry in their bunkers when they start out will be required to make the trip. This is in addition to the 13,000 tons which the torpedo boats will burn in making the voyage. All told, in the neighborhood of 125,000 tons of coal will be consumed.

On the way to San Francisco the fleet will coal five times, first at Trinidad, next at Rio, then at Sandy Point in the Straits of Magellan, then at Callao, Peru, and last at Magdalena Bay. There are only nine navy colliers available for the purpose on the Atlantic side, and one, the Saturn, on the Pacific side.

It has been decided that four small colliers, the Hannibal, Sterling, Marcellus and Nanshan, each carrying about 2,200 tons, shall be sent to Trinidad. They will supply fuel sufficient to carry the ships to Rio, where five of the large navy colliers will be in waiting for the battleship. These colliers will be the Ajax, Aberenda, Brutus, Caeser and Nero, each carrying approximately 4,000 tons.

To supply coal at the three other places it will be necessary to contract for its delivery in chartered ships. Arrangements to this end already have been begun. Wherever it is possible American ships and American coal will be used, but when this it practicable, it is reported that foreign bottoms and foreign coal will be obtained. Four colliers of 6,000 tons each will be sent to Sandy Point, four with a similar amount to Callao, and four to Magdalena Bay. There is or will be sufficient coal afloat in San Francisco to fill the bunkers of all the battleships when they reach that place.

The torpedo boats will coal in dock and from merchant ships at various places along the route. It will be necessary, however, to coal all the big ships at sea.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

THE NEW WEST NEEBISH CHANNEL

The new channel for down-bound boats that the government is digging on the west side of Neebish island in the St. Mary's river at an approximate expense of $4,500,000 will be ready for navigation for the first boat next year. When this passage is opened, down-bound vessels will have their own course practically from Six-mile Point in the Little Rapids cut down to Mud lake. passage which had to be cut through the rock was excavated "in the dry" so that one may see just what kind of channel has been built and the representative of the MARINE REVIEW, having the privilege of walking through the entire length, readily accepted the engineer's statement that the West Neebish channel will be the safest and most easily navigated passage in the rivers. the lower end into Mud lake. The upper end is completed, the lower end will be in about a month and the rock cut probably late in the fall. The channel has been dug to give a depth of 21 ft. below water level except where the bottom is rock and there the depth will be 22 ft. The inside width of the channel will be 300 ft. and instead of center range lights the lights will be placed

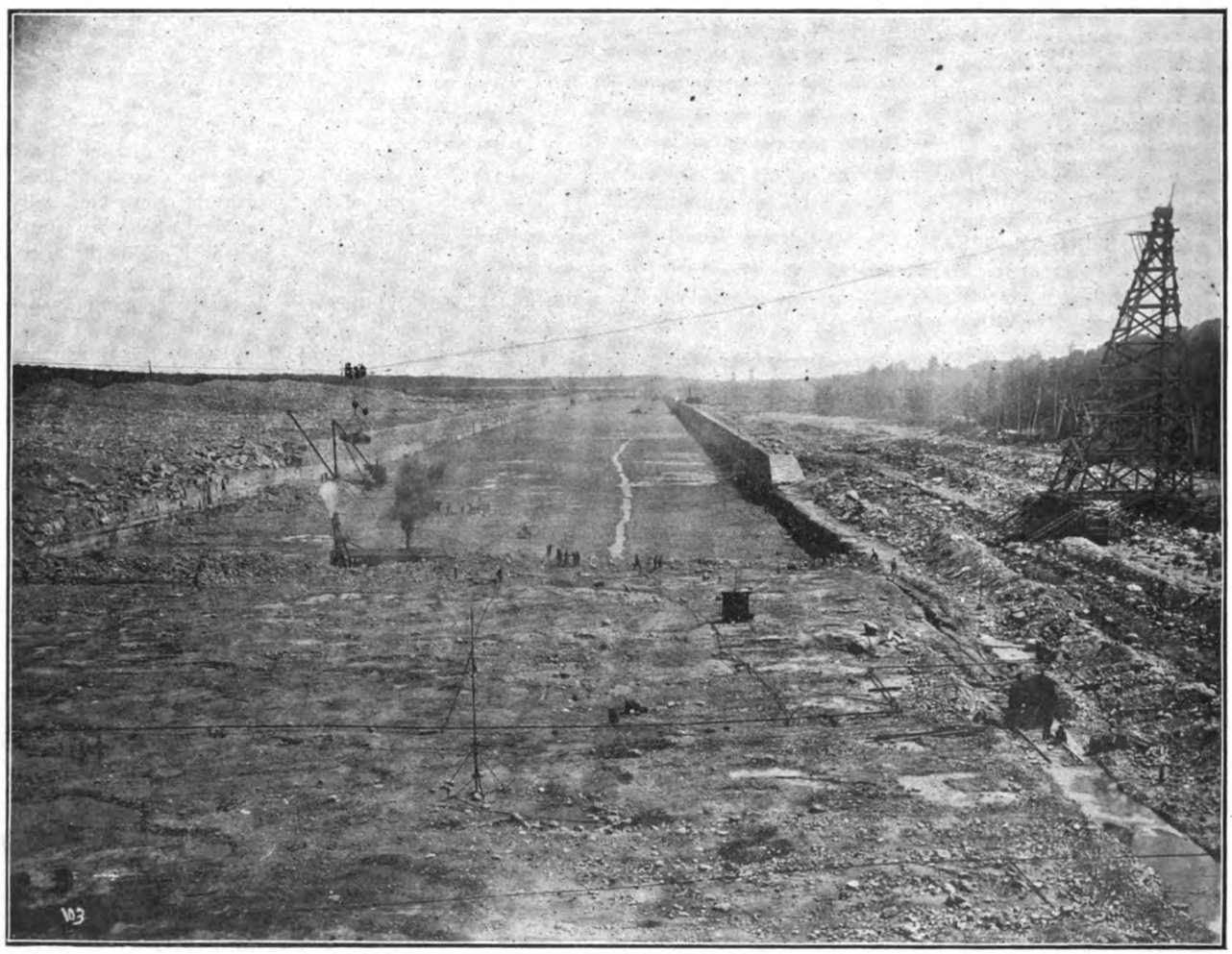


FIG. 1.—VIEW LOOKING DOWN STREAM THROUGH THE ROCK CUT.

With such turns in the Middle Neebish as that at the Encampment, the government wisely appropriated even the above immense sum in providing this second passage thus obviating the difficulties with which boats now have to contend in passing between Mud lake and Hay lake. The work which was begun in April, 1904, has not only been done well but very rapidly and marine interests are fortunate in that the channel will be ready for boats a half season ahead of the time specified. That part of the Fig. 1 is a view looking downstream through the rock cut.

The sketch Fig. 2 is a reproduction of the government chart showing the exact location of the dredged channel which is approximately 13½ miles long. The small circles indicate very closely the location of the lights to be placed along the sides of the channel. The excavating naturally divided itself into three sections, the upper end in Hay Lake, the middle portion or rock cut through the West Neebish rapids and along the sides beginning with one on either side of the entrance in Hay lake. The lights will be mounted on cribs and so hung that they will be directly over the toe of the sloping side of the channel so that captains will known exactly when they have 21 ft. of water under them. All that will be necessary will be to keep between the lights and there will be no occasion for hugging the center as is commonly done where range lights are used even when another boat wishes to pass. A sufficient

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

number of lights will be placed so that at any point of the channel there will be at least two on which to line up a boat. In the rock cut of course the lights will be set on the walls which rise several feet above the water level.

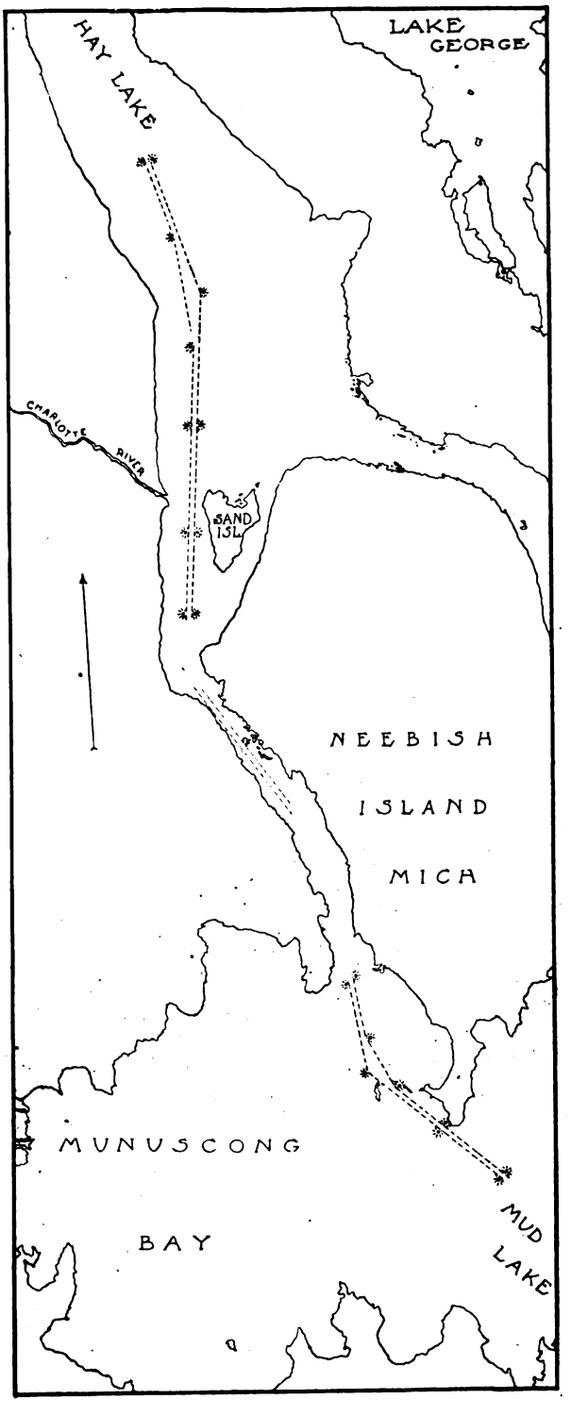


FIG. 2.—CHART SHOWING EXACT LOCATION OF THE DREDGED CHANNEL.

As indicated in the sketch the channel begins in Hay lake about a mile below Nine-mile Point and nearly opposite the entrance to the Middle Neebish channel. Above this point however the old channel is wide enough so that down-bound boats can keep off the present course from the head of Hay lake with perfect freedom heading directly for the new channel entrance. The first stretch of the West Neebish has a length of about six miles to the foot of Hay lake with but one turn and that an easy one and the work here which was done by a dipper dredge is already finished and the channel swept. The former depth was from 3 to 5 ft.

At the end of Hay lake where the channel narrows down around the extreme westerly point of Neebish island and where formerly the West Neebish rapids ran over a solid ledge of hard Niagara limestone with a water depth varying from a few inches to several feet for a distance of 8,600 ft., the channel shown in Fig. 1 has been cut through. As stated, above the depth of this cut will be 22 ft. below low water level, the bottom which for the most part follows the stratification of the rock is as smooth as a boulevard and all the boulders exceeding in size an approximate limit of 5 lbs. will be removed. The walls a view of which is shown in Fig. 3 are for the most part channeled out of the solid rock and elsewhere are built of heavy hewn stone taken from the cut. They will rise 6 ft. above the low water level which gives them a height of about 27 ft. and their minimum thickness at the top is 5 ft. The up-stream ends of the walls are sloped off as shown in Fig. 1 as a protection against the impact of the ice and so well are the walls constructed that should any future improvement of the channel make it necessary they could easily be made water tight. All this work was done for 8,600 ft. after cofferdams had been constructed at each end and the water pumped out so that every foot of the cut has been actually inspected. The remainder of the 13,300 ft. of the rapids was excavated with a dipper dredge.

Below this section the channel has a natural depth of 21 ft. or more for a distance of about two miles which left a three mile stretch to Mud lake through sand, mud and clay, to be excavated. This last section has but one turn in it and even a casual glance at the chart shows that the new channel in its entire length is considerably straighter than the Middle Neebish. A 21-ft. draft in the river which will remove the necessity of loading down bound boats to suit the stage of water at the Encampment will be a boon to vessel men and although the number of boats coming up loaded has been an unusually large proportion of the total traffic so far this year, it is still so small a percentage as to be a much less important consideration. At that however the Middle Neebish is to be dredged to a 21-ft. depth as soon as the West Neebish is finished though traffic will not be interrupted through the older passage. It is also expected that river current will be less with the new channel completed.

From an engineering standpoint the two ends of the channel have of course been the ordinary dipper dredge work but the rock cut has been a very noteworthy undertaking. Fig. 4 shows in a measure something of the operation. The contract for this work which covered the section 13,300 ft. long was

Generated on 2024-08-28 14:03 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

awarded to MacArthur Bros. Co., of Chicago, who built the cofferdams and sublet the contract for removing the rock, about 1,700,000 cubic yards, to Grant, Smith & Co., also of Chicago. The dredge work outside of the dams was done by Edward Bros., of Sault Ste. Marie.

The plan of operations may be briefly described as follows: Two temporary cofferdams about a thousand feet apart and midway between the main dams were first built to stop the flow of water through the West Neebish so that the main cofferdams could be built without having to contend with a from 3 to 5 mile current. This temporary construction also permitted that 1,000 ft. section to be pumped out and work started from the middle portion of the cut as early as July, 1904, before the main dams were completed. The full advantage of this appears in connection with the method and apparatus for handling the rock. The rock is transported from the cut to the spoil bank in trays that carry about 5 yards and which are suspended and operated from a cable railway hung between wooden towers from 800 to 1,100 ft. apart, as shown in the illustrations. There are four of these towers intended to be worked in pairs each pair moving from the center of the cut toward the ends. These towers have a clear height of 103 ft. and contain 85,000 ft. of timber so that it is evident they are cumbersome and difficult things to move though they must be moved along the cut as the work is completed. It was necessary therefor that the towers be started at the middle and the progress of the work so planned that the towers should arrive at the opposite ends simultaneously, for to have a tower idle would mean a considerable loss and to move it the length of the cut a costly and almost impossible task. The advantages of the temporary dams were therefor two-fold.

The walls were first channeled out 300 ft. apart with channeling machines, the rock blasted and then loaded on to the trays mentioned above by steam shovel. There are two shovels, one for each pair of towers, with traction gear and broad tires so that they are self propelling right on the rock bottom. They are 65 ton Marion shovels with 2½ yard buckets. Work was started with but two towers, the others being added as the excavated space became large enough.

While the actual excavating work was being started the main cofferdams were being built. Material dredged out elsewhere and loaded into bottom dump scows was first used until the dams reached such a height that the bottom dump scows could no longer get over them. The material was then loaded onto the dam from ordinary deck scows by a derrick scow. The up-stream dam was completed Nov. 1, 1904, and the down stream dam in April, 1905, after which the pumping out of the water was immediately accomplished.

Many novel expedients were resorted to in overcoming the difficulties attend-

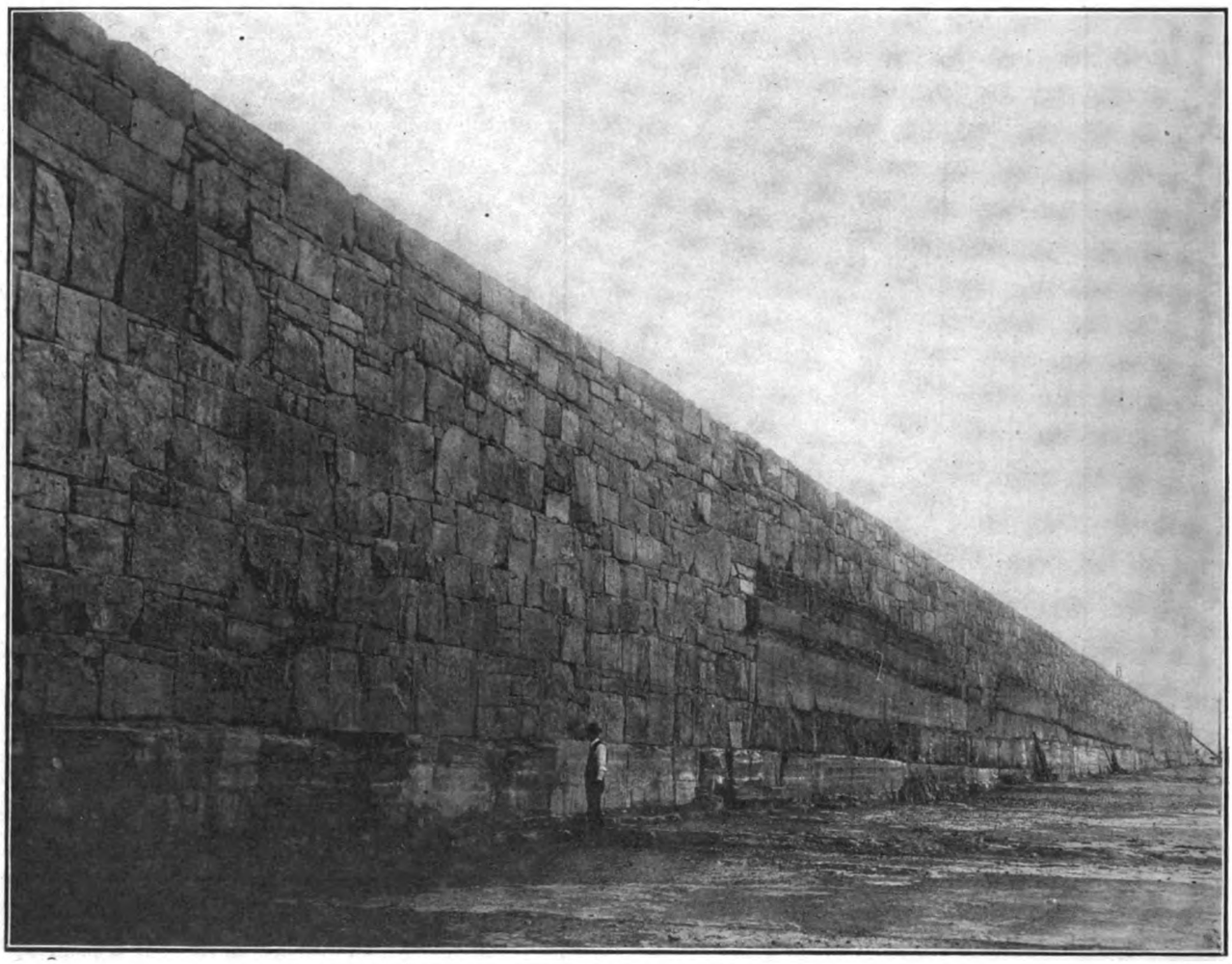


FIG. 3.—SHOWING THE HEIGHT AND CHARACTER OF THE WALL.

Generated on 2024-08-28 14:07 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

ant upon work in the winter and the special problems involved and the contractors have accomplished the work with credit.

MARINE STEAM TURBINES.

At the Bordeaux International Congress and summer meetings of the Institution of Naval Architects last week, the Hon. C. A. Parsons, C.B., F.R.S., and Mr. H. Wheatley Ridsdale, read a paper entitled "Some Practical Points in the Application of the Marine Steam Turbine." There were in service, they said in the course of it, now sixty-one steamers fitted with Parsons turbines, and sixty-five under construction, representing a total horse-power for merchant vessels and yachts of about 590,000 I. H. P., and for war vessels about 800,000 I. H. P. Some of the vessels first fitted had been running now for some years; for instance, the King Edward for six and a half seasons, the Queen Alexandra, for five and a half seasons, and the Queen, for four years, while others had only recently been put into service. The greater part of the running had been done in passenger service in waters frequented by a large amount of traffic, and with very frequent and difficult arrivals at and departures from harbors and piers. In view of the fact that the whole of this service had been conducted with unusual regularity and without a serious mishap of any description, and that the ships were fitted with an entirely new type of machinery, the inference seemed to be conclusive as regarded the safety with which turbine propelled vessels could be handled, and the authors proposed now to examine the facts in regard to the manoeuvring qualities of turbine vessels, merely remarking in passing that the majority of these ships had been handled by men coming direct from paddle or ordinary screw vessels, without any period of apprenticeship to turbine boats. In the actual handling of a steamer in crowded waters, in narrow channels, in entering harbors, and in approaching piers and landing stages, or in docking and undocking, the reliability of her reversing arrangements—the perfect and prompt obedience of the machinery—was the primary consideration. It had been stated by a well-known ship owner in a discussion on a paper a few years ago that "more cases of accidents come up at Lloyd's Classification committee through striking dock walls and pier-heads than from any other cause." Such accidents must be principally due to the engines themselves failing to respond quickly to the orders from the bridge. The relative absence of accidents from such causes with turbine steamers went to prove that the certainty in handling was far greater than in the case of reciprocating engines, and if the man in charge knew that his ship could be brought up with absolute certainty within a distance ascertained by experience, he quickly acquired

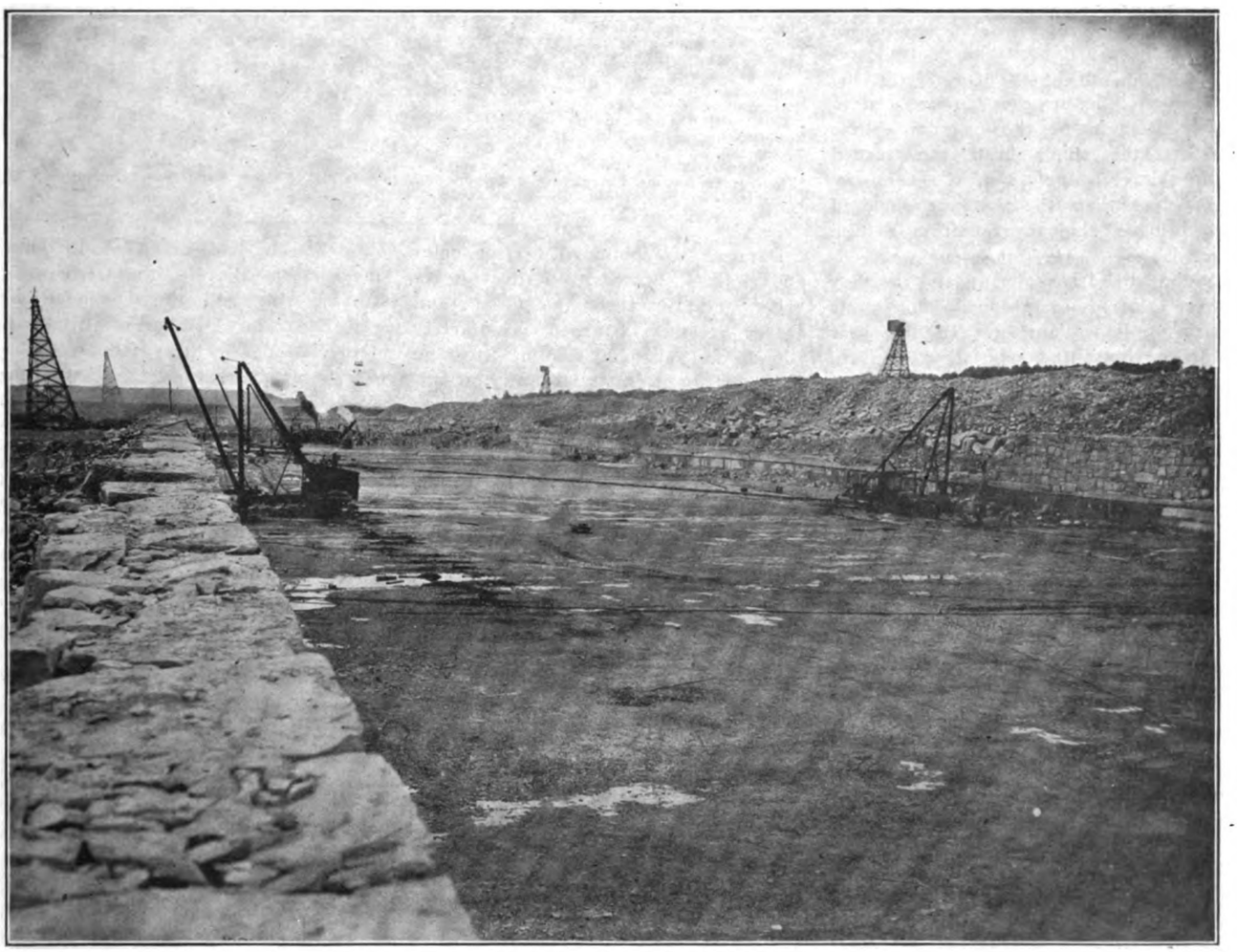


FIG. 4.—LOOKING DIAGONALLY ACROSS THE CHANNEL.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

great confidence in handling her, whatever that distance might be. The figures of actual results given below were sufficient to show that turbine ships were stopped from the moderate speeds ahead generally used in handling in practically the same, if not in less, time or distance than ordinary twin-screw vessels of the same class, and from higher speeds in not very much greater time or distance. It might be questioned whether the necessity of bringing a ship to rest from a high speed in the shortest possible distance on a straight course was of common occurrence in actual seagoing experience. In all cases where the authors had been able to trace reliable data the half diameter of the turning circle, or the distance run in the direction of the original course before the ship's head was turned through eight points of the compass, was less than the distance required to bring a ship to rest from a high speed, even with the engines continuing to drive ahead; and if they were slowed or stopped, the circle was of less diameter. In the year 1877 a committee, consisting of Lord Kelvin, W. Froude, James Napier, and Prof. Osborne Reynolds, was appointed to study the behaviour of screw steamers when reversing the engines, and it was demonstrated in their report that "full speed astern" might often bring about a collision, whereas by steaming ahead and using the rudder, it might be avoided. As an instance, the turbine steamer Viking, 350 ft. B. P., and with a displacement of some 2,500 tons, when steaming ahead at 20 knots was found to have a turning circle 1,475 ft. in diameter, or about 4.2 lengths of the ship. Such a ship would require about 2½ lengths to stop in when reversing the engines and maintaining the course. It was, therefore, evident that the ship's head could be turned through 90 degs. by combined use of rudder and engines in much less distance than 2.5 lengths. The following figures might also be compared:

COMPARISON OF TURNING CIRCLES, AND DISTANCE REQUIRED TO STOP FROM HIGH SPEED.

SHIP AND TYPE.	FULL AHEAD SPEED. Knots.	SPEED AHEAD FROM WHICH TRIAL MADE Knots.	DIAMETER OF TURNING CIRCLE. Feet.	DISTANCE RUN BEFORE STOPPING FROM SPEED IN COLUMN 3. Feet.	Lengths.	TIME ELAPSED. M. S.	FULL ASTERN SPEED.
Turbine ss. Viking, Channel screw steamer	23.5	20	1,475	.....	...	1 45†	..
Turbine ss. Princess Elisabeth, Channel screw steamer	24	20	.....	690	2.0	1 26	16
Turbine ss. Queen, Channel screw steamer	21.75	19	.....	780	2.5	1 7	12
Turbine ss. Lubeck,* small cruiser	23	22	.....	1,530	4.5	1 45	..
Turbine ss. Destroyer	28	27	900	715	3.6	0 38	16
Reciprocating ss. Nebraska, battleship	..	19	1,050	.....	...	.....	..
Reciprocating ss. Indiana, battleship	..	14.5	.....	1,080	3.0	.....	..

*The figures for the Lubeck are given on authority of the *Marine Rundschau*, December, 1906.
†This trial was made from full speed ahead.

Data as to combined use of helm and engines showed even superior results. For instance, the Calais and Dover steamers turned completely round, and changed from steerage headway to steerage sternway in under 2 minutes. Reversing turbines had been fitted from time to time of such power as the conditions of service demanded. In recent turbine installations the revolutions astern attained at the moment of stopping the headway had been from 65 per cent to 80 per cent of full ahead revolutions in the case of ordinary three-shaft turbine steamers. Installations with four shafts had had astern turbines fitted to all shafts, the arrangement consisting of two turbines in series on each side of the vessel. The number of such installations was still too small to enable them to make reliable comparisons as to results. The question of speed under stern-way might be very lightly touched upon, because if sufficient stopping power were given to the ship, she would be sure to run astern much faster than was required for practical purposes. At least two turbine vessels had exceeded 16 knots under stern-way, viz., the German destroyer S125 and the Ostend-Dover serivce steamer Princesse Elisabeth, in the latter case the speed astern being as high as 68 per cent of that reached ahead. Much depended on the suitability of the stern lines for temporary use as a "bow." Reversing turbines originated with the one row of reversing blades used in the single radial flow turbine first fitted to the Turbinia (1894), which exhausted, as in present practice, direct to the condenser by the same passage as the ahead working blades. In the Viper and Cobra the reversing turbines were independent, but in the next vessels, King Edward and Velox, the form now universally used in Parsons turbines was adopted, a parallel flow turbine being used, mounted on a prolongation of the main low-pressure ahead spindle and situated in the exhaust chamber. In four-shaft vessels with reversing turbines in series, the high-pressure reverser was built as an independent turbine (as in Viper and Cobra), while the low-pressure reverser was of the ordinary type as above described. It might be thought that powerful reversing turbines would be desirable to enable the ahead rotation of the engines to be very speedily checked and reversed. As a matter of fact this did not appear to be necessary, because so long as the reversing turbine was revolving against the contrary flow of steam, the effective steam pressure on its blades was very considerably greater than when running normally, thus forming an extremely powerful brake. The amount of torque developed on the shafts was,

RESULTS OF STOPPING TRIALS FROM COMPARATIVELY LOW SPEEDS.

Ship and Type.	Speed ahead before reversing. Knots.	Distance run before stopping. Feet.	Lengths.	Time elapsed before stopping. m. s.
Turbine ss. Queen Alexandra, river steamer	10	210	0.78	0 47
" Dieppe, Channel steamer	12	300	1.1	0 41
" Princess Elisabeth, Channel steamer	17	516	1.5	1 5
" Lubeck,* small cruiser	5	165	0.48	.....
" Lubeck, small cruiser	9	360	1.05	.....
" Lubeck, small cruiser	11	635	1.78	.....
" Destroyer, 400 tons	7	157	0.75	0 27
" Destroyer, 400 tons	9	144	0.72	0 23
" Destroyer, 400 tons	12	340	1.7	0 29
" Destroyer, 400 tons	17	560	2.8	0 33
Reciprocating ss. Indiana, battleship	14.5	1.080	3.0	.....
" Hamburg,* small cruiser	5	184	0.54	.....
" Hamburg, small cruiser	9	360	1.05	.....
" Hamburg, small cruiser	11	590	1.75	.....

*These figures are given on the authority of the *Marine Rundschau*, December, 1906.

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

of course, a matter of small importance, provided the full surface of the propellers were utilized. It was found in one case that the power measured by torsion meters during a continuous run astern varied from 20 to 25 per cent of full power ahead, while the maximum torque measured, while reversing and stopping the ship, gave as much as 35 per cent. of ahead power. This was in a vessel having an installation of reversing turbines of not quite the most favorable description. Even thus, however, the direction of rotation of the shafts was changed in about 12 seconds from receiving the order, and the reversing turbines were sufficiently powerful to cause cavitation by the propellers up to the time the ship's way was stopped—evidently the limit of useful effect. The relation of speed in rough water compared with that in smooth of a turbine vessel was of considerable importance, and there was a difference in this respect between different types of ships. The vessels which lost most speed in disturbed water were those propelled by paddle wheels, and this was especially so with a beam sea. Screw-propelled reciprocating vessels were most affected by the racing of the propellers. In turbine-propelled vessels, on the other hand, the screws, owing to their small diameter and great depth of immersion, never raced, and full steam could be maintained in all states of the sea with absolute safety to the machinery. That the revolutions were very little increased, even in exceedingly rough water, was proved by the fact that no case had yet been recorded of the safety cut-out being brought into action in any vessel on service, although it was usually set to cut off steam should the full speed revolutions be exceeded by from 5 to 10 per cent. These facts applied to all turbine vessels. Cases were known of torpedo boats and destroyers having been run up to normal full power in very heavy weather with entire freedom from accident, the limiting factor of speed under such conditions coming from the bridge, due to considerations of safety of the vessel, and not from the engine room. The earliest demonstration of this quality in light high powered turbine craft was given by the Turbinia in 1897. Several cases might be cited in illustration of what could be attained in actual practice with channel steamers, but they might instance the trip of the Princesse Elisabeth in the winter of 1905-6, when she performed the 60-mile run between Dover and Ostend at an average speed through the water of 22 knots, in weather officially described as a moderate gale—i. e., wind force 7 to 8, or about 25 knots. This for a vessel 344 ft. long, and drawing only 10 ft. of water, spoke for itself. Ships of fuller form with the bows above the water line flared out to an extreme amount, encountered in a head sea an augmented hull resistance proportionately greater than the classes of vessels just spoken of. The intermediate type of ship with turbine machinery might under special circumstances, fall off slightly more in speed than when fitted with reciprocating machinery when the pitching was sufficiently severe to cause largely augmented hull resistance without being sufficient to necessitate easing the reciprocating engines on account of racing, but in all conditions of weather over the length of the voyage, it was very questionable whether even in this class of vessel the turbine boat was not equal or superior in this respect to the ordinary reciprocating engine vessel. The express type of liner with turbine machinery would probably be at an advantage over that with reciprocating engines in all conditions of wind and sea, just as her small prototype, the channel steamer, was. Pitching of this type augmented the hull resistance but inconsiderably, but the propellers of reciprocating engines were very much more liable to race in this class of vessel. Warships (other than destroyers already mentioned) naturally followed the same principles. Experience had already shown that small cruisers and vessels of the small scout type with turbine machinery compared very favorably in this respect with their reciprocating sisters. A small turbine cruiser of only 340 ft. length had run a 24 hours' trial at 20 knots in open water with wind force up to 7, which speed could only with great difficulty and some danger to the machinery be maintained by a smiliar vessel with reciprocating engines. As regarded turbine battleships, the reported performances of the only existing example today, the Dreadnought, pointed to the absence of any difficulty or abnormal loss of speed in bad weather.

SUBMARINE SIGNALING.

The Submarine Signal Co. has received cable advices that the British Board of Trade has authorized Trinity House (the light-house establishment of Great Britain) to begin the equipment of light-vessels in the English channel with submarine bells. This action opens to the company the market of the greatest maritime nation in the world. The delay has been due to a contest between the shipowners and the government as to whether payment for this aid to navigation should be made from light dues paid by the vessels or from the national exchequer. The government, recognizing the great advantage of submarine signals to the navy as well as to the commercial marine, has determined to install bells at its own expense.

The German agents of the company are installing the receiving apparatus on one of the cruisers of the Russian navy now at Kiel.

Capt. Osterhaus of the flagship Connecticut reports that he made a successful test of the submarine signals while passing Nantucket Shoals, getting the bell at a distance of eight miles. He says: "This, my first experience with the bell, was most satisfactory and encouraging."

STEAMER NEW YORK'S FAST TRIP.

What Secretary Hawley of the People's Day Line announced as the fastest trip ever made by a river steamer to Albany from Manhattan was recorded by the New York of that line on Sunday. For the purpose of interchanging with the new Hendrick Hudson, the New York made the trip in 7½ hours, sometimes running at a speed of 27 miles an hour.

The New York is a big boat, a side-wheeler, built in 1887, and of rather light draught, as is demanded by the river service. She left Desbrosses street Sunday morning at 9:30 o'clock and arrived in Albany at 5 in the afternoon, making no stops. From this gross time the officials of the company deduct 25 minutes for raking down the fires and 52 minutes for slowing down in the channel so that the swash from the big boat would not swamp tows. The boat was in command of Capt. A. H. Hartford.

BIDS FOR DUMP BARGES.

The following bids were secured by the Isthmian Canal Commission for the construction of two steel dump barges for use in the Panama canal:

Maryland Steel Co., Sparrows Point, Md.		$59,495.00
Merrill-Stevens Co., Jacksonville, Fla.	(a)	97,500.00
	(b)	105,000.00
The Moran Co., Seattle, Wash.	(a)	66,645.00
	(b)	55,500.00
Newport News S. B. & D. D. Co., New York City	(a)	66,000.00
	(b)	69,000.00
Lewis Nixon, New York City		76,950.00
U. S. Products Exp. Co., New York City		85,575.00

McAllister & Bennett, consulting engineers and naval architects, have removed to suite 22 Haller building, Second avenue and Columbia street, Seattle, Wash.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

HYDRAULIC RIVETING IN THE "MAURETANIA."

BY E. W. DE RUSETT.

As one of the most important factors in the construction of a steam vessel is the riveting—and especially so in vessels of such dimensions and power as the Mauretania and her sister vessel, Lusitania—it was determined to resort to hydraulic riveting to a much larger extent than usual, primarily on account of the thickness of the plates, 22-20 in., and the length and large size of the rivets. This decision was come to after duly considering the effect of hydraulic riveting on the progress of the work, and it was considered advisable to extend it to the following parts of the structure, viz., the keel plates, center keelson, the garboards to allow of their being in the range of the double bottom, also the connection of shell to stem and stern castings, floors, frame bottoms and top bars, tank girders, web frames, reverse bars to frames and tank side knees, and also the girders forming the engine seating.

The topside plating and doublings are also hydraulically riveted for a length of about 520 ft. amidships, and the shelter deck stringer and doublings for a length of about 440 ft. as shown in Fig. 1.

The seams of the bottom shell plating of the vessel, where hydraulic riveting was resorted to, are arranged clincher fashion, so that the machines could close the work strake by strake. The frame bottoms are joggled. The bottom shell butts are double strapped, the inner strap having three rows of rivets, two of which are close pitched, the outer row being wider spaced. The

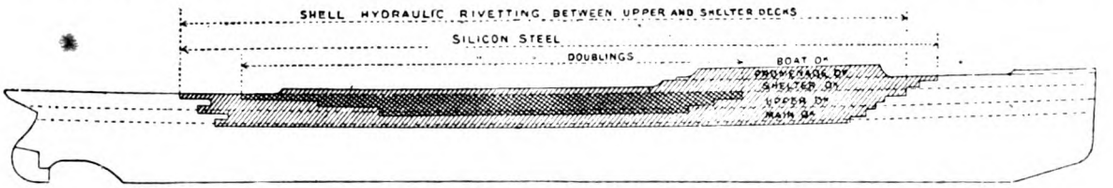


FIG. 1.—PROFILE, SHOWING EXTENT OF HIGH TENSILE STEEL AND HYDRAULIC RIVETING OF TOP SIDES.

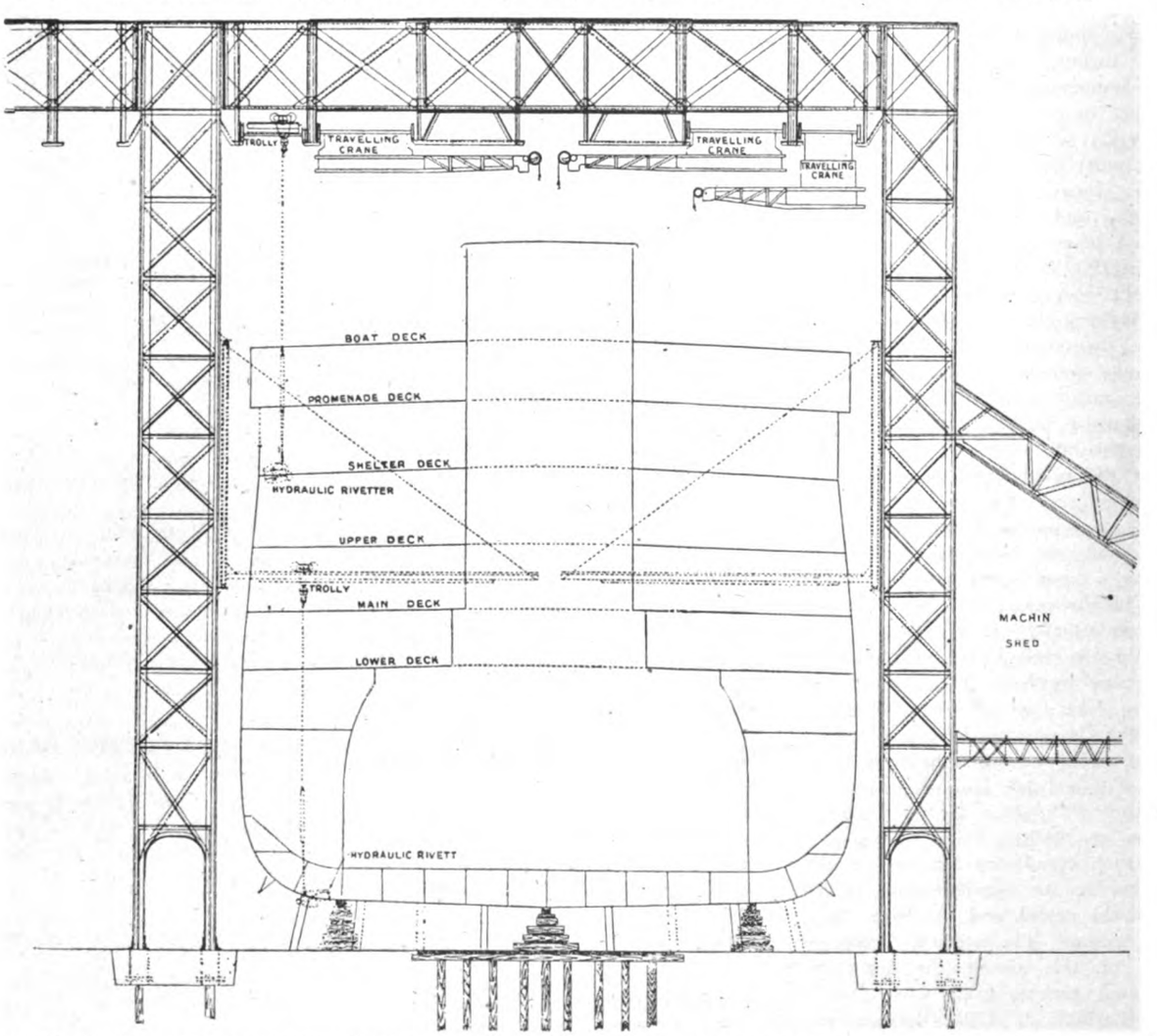


FIG. 2.—MAURETANIA IN SHIP BUILDING SHED, SHOWING ARRANGEMENTS FOR SUSPENDING AND TRANSPORTING BY HYDRAULIC RIVETERS.

*Read at the Bordeaux International Congress.

Generated on 2024-08-28 14:04 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

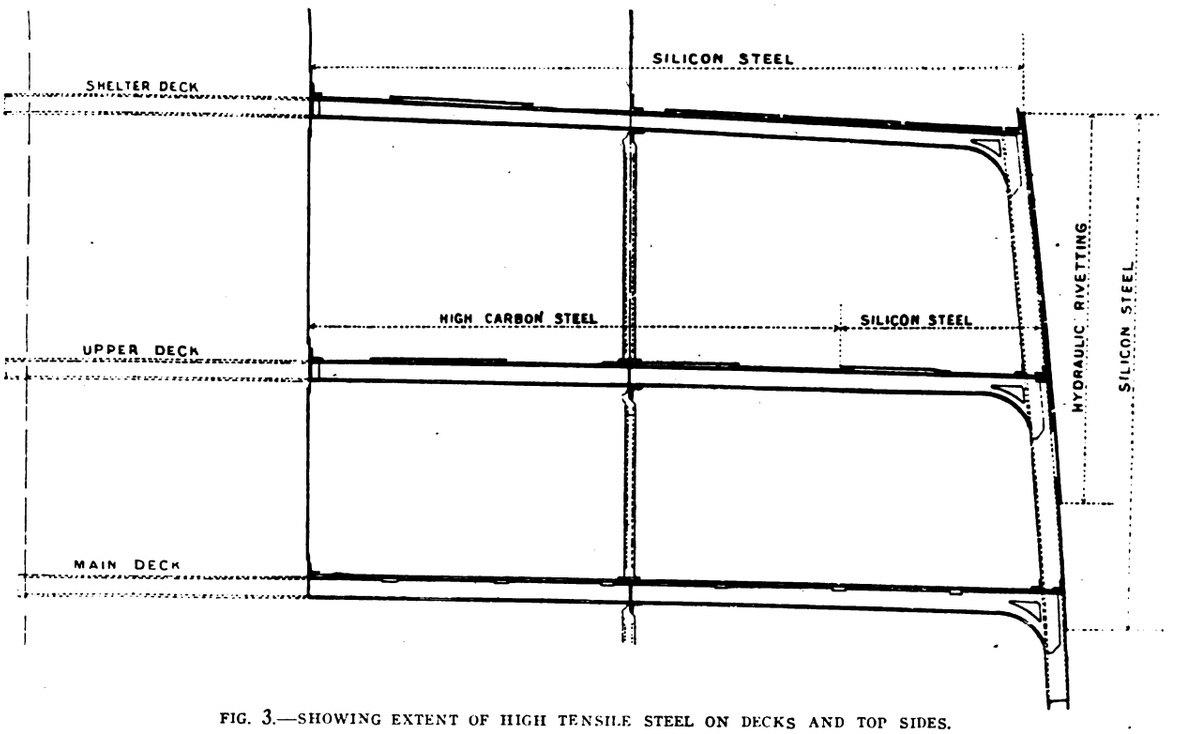


FIG. 3.—SHOWING EXTENT OF HIGH TENSILE STEEL ON DECKS AND TOP SIDES.

outer strap is double riveted, with edges beveled to reduce resistance. The keel is formed of three plates, the middle piece being 1-20th thicker than the garboards, to allow of their being placed in position after the keel plates and longitudinal keelson bars were riveted. The butts of the keel plate are not strapped, as it was found there would be sufficient margin of strength without doing this. By the omission of these straps about ¾ in. of draught was saved. This was of great importance, considering the small margin of dead weight that it is possible to obtain in a vessel of this character on the given maximum draught of water.

The plating of the topside, where the doublings occurred, had to be so arranged that the inner edge of the

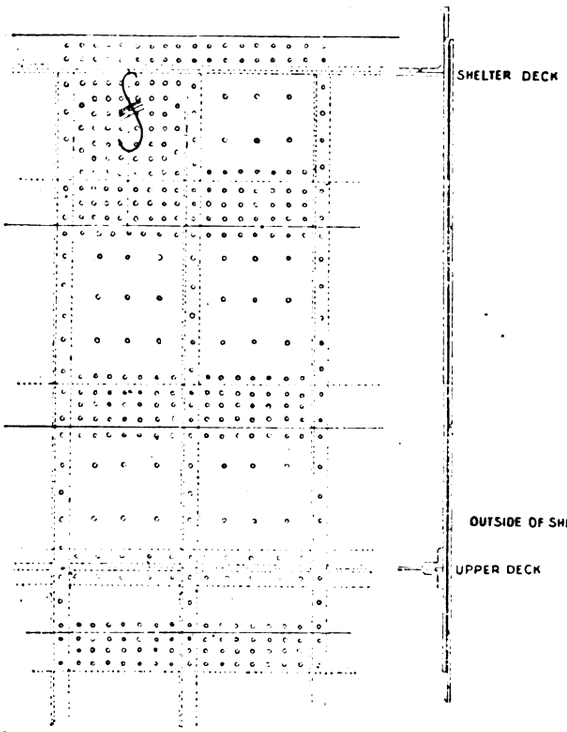


FIG. 4.—SHOWING ARRANGEMENT OF SEAMS OF TOPSIDE PLATING TO SUIT HYDRAULIC RIVETING AND CONNECTIONS OF PLATING AND DOUBLING.

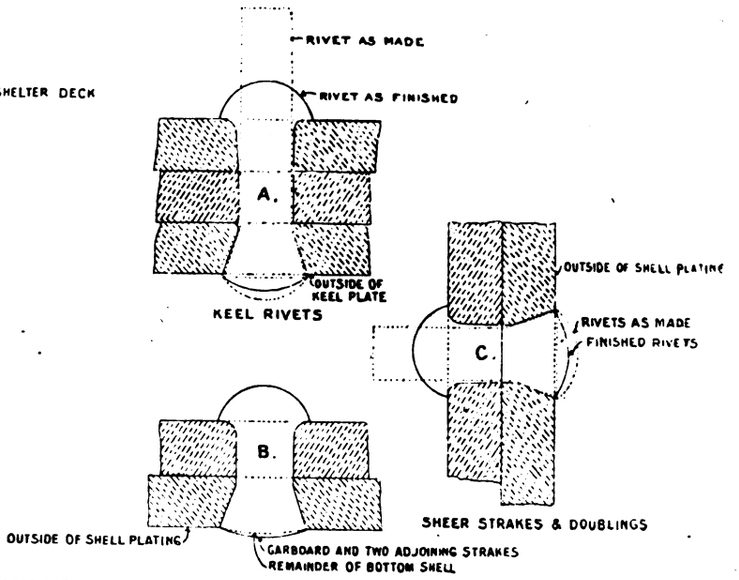


FIG. 5.—SHOWING COUNTERSINK OF RIVET HOLES IN SHELL, BEVEL OF RIVETS AND FULLNESS OF POINTS.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

landing was kept at the top, so that each plate could be riveted up in due order. (Figs. 3 and 4).

The eight hydraulic riveting machines employed were of three sizes, having gaps 5 ft., 5 ft. 6 in. and 6 ft. respectively. The 5 ft. 6 in. gap machines were found to be the most serviceable for general purposes. They were each fitted with an adjustable arrangement by which the pressure could be brought to bear directly through the axis of the rivet at whatever angle the plating lay, the result being that very little trouble was experienced in pressing the rivets fairly into the countersink. The machines were supported by trolleys running in the roof of the shed under which the vessel was built, also from derricks which were guyed from the standards of the shed, as shown in Fig. 2, the trolleys and derricks being so arranged that they could be readily moved to any required position within their range of action. The shell rivets called for very careful consideration, both as regards the convexity of the head and taper of the neck and their length in proportion to the thickness of the plates they connected.

The proper relation of the bevel of the countersink to that of the neck of the rivet was a matter of much importance, otherwise a sound watertight job could not be readily obtained. And, further, to ensure good work, any burr left on the edge of the countersunk rivet head during manufacture was ground off. Fig. 5 shows the bevel of the countersink in the shell for neck and point of rivet, also the bevel of the neck of the rivet before being closed up. It is worthy of remark that it was found by experience that the bevel of the rivet neck had to be less than that in the plate to ensure good closing, otherwise the material did not solidly fill the hole from the root. The angles of these bevels are, for the neck of the rivet 18½ deg., and for the plate 20 deg. each measured from the axis of the rivet. The proper length of the shell rivets was a matter of experiment as the rule for the hand-laid rivets did not apply on account of the great pressure employed in closing them, which amounted to about 50 tons.

By reference to Figs. A, B, C (Fig. 5), it will be observed that the heads of the rivets in the keel were made fuller than those in the garboards and three adjoining strakes, while further up the bilge the heads were finished with only the usual amount of fullness to afford as little resistance to the water as possible. The countersunk rivets in the bottom shown at A and B, were put in from the underside and clenched on the inside, and those on the top-side C were also clenched on the inside, the heads being rounded, as shown in the diagram. The deck rivets were countersunk and flush on the top on account of the deck sheathing, and clenched on the underside.

Mild ingot steel was employed for all the rivets at the strong recommendation of the authorities of Lloyds Register from their experience up to date. The rivet rods were therefore specified to have a tensile strength of from 26 to 30 tons, with an elongation of not less than 20 per cent, and an elastic limit of from 13 to 15 tons. The rivets are of 1⅛ in. diameter, and are spaced to give an area at least equal to the requirements of Lloyds rules for mild steel plates of equivalent strength to the high tensile steel used. Under ordinary conditions of riveting by hand this area might be questioned on account of mild steel rivets being employed for the connection of hard steel plates, but it was considered that the hardening effect produced on the rivet by an hydraulic pressure of 50 tons overcame this objection, and also through the increased efficiency of the riveting, and the fact that the sharp edges of the holes in the plates were removed, as shown in Fig. 5, by a special tool.

Upwards of four million rivets were used, weighing fully 700 tons, a considerable proportion of which are hydraulically riveted. They were heated in oil furnaces, specially designed at the Wallsend yard. Each furnace has a daily heating capacity of at least 3,000 rivets, ⅞ in. by 3 in.

CRUISE OF THE MOTOR CAR.

"Did I ever ride in one of them things?" repeated the ancient mariner as he puffed reflectively on his pipe and gazed at a scarlet touring car whirling rapidly by. "Yes, son, I did oncet, an' that air oncet wuz aplenty, I can tell you."

He paused to rebait his hook. As he flung the line over the wharf he continued reminiscently:

"Yes, sir, oncet I was plumb fool enough to go aboard one of them craft, but it ain't happened again, You see, by nevvy, Bill Simes, bought one while I wuz a visitin' him, an' nothin' would do but that I should be along on the trial trip. It wuz surely a fine-lookin' craft, from the lanterns on the bow to the pilot's license over the stern.

"Marcia—that's Bill's wife—an' her sister went up the gangplank an' settled themselves in the tunner, or some such word, while Bill an' I went for'ard. Bill took the helm, we up anchor, an' wuz off.

"We went slow at first, so as not to collide with other craft, an' Bill had to keep his weather-eye open, I can tell you. First it wuz hard aport, an' then hard astarboard, an' we had to beat our way among trolleys an' trucks an' all kinds of shoals.

"Finally we did reach deep water—open country, Bill called it—an' then we crowded on all sail an' went flying along before the wind at thirty knots. As we wuz skimmin' along at this lively clip we wuz overhauled an' ordered to heave to. I natchelly thought of pirates, an' wuz fer crowdin' on more sail, but Bill said it wuz a revenue cutter an' brought his craft up in the wind.

"Bill apologized fer breakin' the laws of navigation, promised to take in sail, an' we bore away on our course again.

"I wuz just figgerin, on takin' some of the money I had salted down an' buyin' myself a sister ship to this craft, when there came a rip-tearin' sound from somewhere in the hold an' we were caught in stays. Well, Bill took off his pea-packet an' crawled under the keel, an' worked an' worked, an' ground the windlass, an' nary a groan would she give.

"Marcia she an' her sister began to ask all sorts of questions, an' the more they asked the madder Bill got. There we lay, becalmed-like, an' as luck would have it we were miles from port an' out of the reg'lar track of vessels.

"It grew dark, an' I wuz fer sendin' up sky-rockets, but Bill just called me an' ol' fool. Think of it! Me that wuz captain of the best clipper ship that ever left this port!

"Then a rain came up, so we managed to crawl under some tarpaulins on deck while Bill worked down below. Finally, just as we began to think we were marooned fer sure, we saw the lights of a craft bearing down on us, an' I hailed her with a 'Ship ahoy!'

"We wuz glad to see it, I can tell you, fer we wuz all hungry, with not even a bite of hardtack aboard, an' it had rained so that the water wuz runnin' out of the scuppers, an' I thought we would founder, sure enough.

"So, the other skipper got a cable, an' Bill came up from below. By this time he an' Marcia weren't on speakin' terms. We made fast to the stern of the other craft an' wuz towed into port, hungry, an' soaked to the skin. I guess in addition to havin' our vessel drydocked in the garage Bill had salvage charges to pay, too.

"So, now, son, you see why I ain't got any more hankerin' after them things. Give me a schooner or a sloop, or even a dory, but no automobiles fer me!"—*The Ocean.*

Generated on 2024-08-28 13:59 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

RETIREMENT OF A VETERAN MARINE ENGINEER.

At the end of May, there retired from the service of the London & Northwestern Railway Co.'s service of steamers plying between Holyhead and Ireland, one of the oldest marine engineers in Britain, in the person of Mr. Wm. Ankers, who has had 50 years' service in connection with the fleet. When he joined the company as a lad the steamers used to land at Kingstown, but even in those days the journey was accomplished in about four hours, with only a consumption of coal of 12 tons for the trip. The present fine ships, of which the Cambria was the first, occupy 3 hours and 25 minutes in the longer run to North Wall, Dublin, and consume 42 tons of coal per trip. Mr. Ankers was chief engineer on the Stanley when that vessel was contesting the claim of the mail steamer Ulster as the greyhound of the channel. An exciting race across channel resulted in a win for the Stanley, she being about 15 minutes ahead when the Kish light was reached. Mr. Ankers can justly claim to have seen great changes in marine engineering. He was entrusted with the duty of supervising the building of all the London & Northwestern steamers which have been added to the fleet during the last 40 years, and he has spent a good deal of time at Belfast and on the Clyde in these matters. Mr. Ankers is still hale and hearty after his long experience of the heat of engine rooms, and will enjoy a substantial pension for the remainder of his life. Mr. Ankers has made across the channel no less than 13,000 trips and covered a distance of no less than 760,000 miles, equal to thirty times the distance around the earth.

WILLIAM ANKERS.

SMOOTH-ON.

The history of Smooth-On while not very old is rather interesting. This chemical iron compound was made in 1893 by Vreeland Tompkins, a chemical student and graduate of Rutgers College, the object being to make a chemical iron that could be easily applied to cracks and holes in iron to make permanent repairs.

A compound to make such repairs must metalize practically as hard as iron. It must expand while metalizing, so as to completely fill any opening into which it is introduced and also force itself into the grain of the iron. When metalized, it must expand and contract the same as iron. After two years' work this was accomplished and a chemical compound made and named Smooth-On, which forms the base or starting point for the different Smooth-On iron cements.

The above properties make Smooth-On a valuable compound for making chemical iron cements and to this subject the chemist of the Smooth-On Manufacturing Co. has given careful study for twelve years and has succeeded in compounding the valuable iron cements known so generally throughout the world as Smooth-On.

Smooth-On Iron Cement was first prepared only in powder form, and used by mixing with certain percentage of water, to the consistency of stiff putty and immediately applied to cold metal, as it metalized rapidly. In a few hours becoming as hard as iron, with the same color and appearance and the same power of expansion and contraction. This cement while very useful where small amounts of cement were required, it necessitated a hurrying of the work, when handling large quantities of the cement, to get through before the cement got too stiff or hard to work. By further experiments a solvent was found for the above cement which would evaporate upon the application of heat; this enabled Smooth-On to be prepared and kept in paste or fluid form, until wanted for use. The fluid preparation of Smooth-On greatly enlarged its use, as this cement may be applied to hot or cold metal.

There are now six Smooth-On preparations, each made for a special purpose. Smooth-On for foundrymen, the first Smooth-On iron cement made, is for removing blemishes from iron or steel castings and is used for such purposes by the largest iron and steel manufacturing concerns throughout the world.

Smooth-On compound for engineers, the second of the Smooth-On iron cements is for making repairs on steam or hydraulic work, when the application can be made to cold metal. One example will show the value of this cement. Seven years ago the seven million gallon centrifugal pump at the New York navy yard split almost in two, due to a sudden strain. The crack was 20 ft. long, and it was ascertained from the makers of the pump that it would take 26 weeks to produce duplicate castings to replace the broken parts. It was suggested by the engineer in charge who had used Smooth-On compound that he could repair the pump with this cement, and permission was given. It was repaired successfully in three days and is still giving perfect service. This repair saved thousands of dollars for the United States government and made a reputation for Smooth-On compound and the engineer that applied it.

The third Smooth-On iron cement placed upon the market is Smooth-On joints. This cement is for making joints on cast iron hub joint pipes. It makes a very strong and tight joint and one that will stay tight. This cement was used on the hub joints at the New York state buildings at Poughkeepsie, N. Y.

Smooth-On elastic cement, the fourth Smooth-On product, was a great step forward in the compounding of iron cements, as this cement is prepared in fluid or paste form and kept in that state until it is wanted for use, by packing in air tight cans. This fluid cement will run into very small cracks, holes or seams, filling them with iron and by many it is called magic iron. A can of this cement may be purchased in nearly every seaport of the world, as it is universally used by steamship engineers, for making permanent repairs.

The following is an interesting ex-

Generated on 2024-08-28 14:01 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

ample showing the value of this cement:

At the time of the Spanish war the United States transport McPherson arrived at Jersey City from Cuba, with leaking seams in her boilers. To stop these leaks in the ordinary way would have delayed the sailing of the ship. By applying Smooth-On elastic cement to the boiler seams, the leaks were quickly and permanently stopped and the steamer sailed on schedule time.

The fifth Smooth-On specialty, Smooth-On iron cement sheet packing, is a combination of Smooth-On iron cement No. 1 and rubber. The Smooth-On in the packing has the same action as when in the powder form, namely of expanding slightly when it comes in contact with steam, hot or cold water. This makes it a valuable packing, as it completely fills any uneven places in the flanged faces, making a perfect joint instantly. This packing is extensively used in the engine room of the Brooklyn bridge.

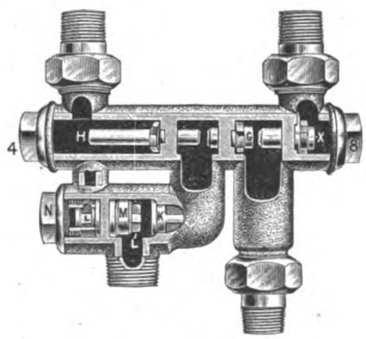
The sixth Smooth-On specialty is the Smooth-On coated corrugated steel gasket. It is made from specially prepared mild, tough steel, stamped with concentric corrugations and then coated with Smooth-On elastic iron cement. For flanged joints they will withstand any pressure or temperature that the pipe will stand and are not affected by steam, water, oil, air or ammonia. The above gaskets are being successfully used under 3,000 lbs. pressure in hydraulic mining.

HANDLING HOT WATER WITH AN INJECTOR.

While a large majority of boilers carry less than 150 lbs. pressure, the usual high working pressure of the ordinary automatic injector, there is an increased demand for an injector operating between 150 and 200 lbs. pressure. There is also a demand for an injector that will handle a water supply that has become heated by use of the syphon (or ejector) and in other ways and is consequently too hot for injectors of the usual automatic type.

In feeding a boiler with water over 120° Fahr. many users of steam experience a great deal of difficulty due largely to their failure to meet the necessary conditions. Consideration must be given to the fact that at a certain point on high steam pressure the condensing qualities of the water are not sufficient. Steam must be condensed before it can pass through the injector. For instance at 180 lbs. steam pressure, the same volume of feed water will not condense the steam that would be sufficient to condense the steam at 120 lbs. pressure. The higher the temperature of the feed water the less are its condensing qualities and vice versa.

These conditions and requirements have resulted in the production of the Auto-Positive "Penberthy" Injector here illustrated.



Sectional View
Auto-Positive Penberthy Injector.

This injector differs materially from any other automatic injector ever before placed on the market, being constructed on new principles, having but five working parts and combining the features of a positive with those of an automatic injector. By this combination it is enabled to handle much hotter water and work on higher steam pressure than any other automatic injector.

Space will not permit our handling the subject as exhaustively as it deserves and we would suggest that those interested correspond with the Penberthy Injector Co. of Detroit, Mich., who manufacture this injector. They are always glad to give any information of a technical nature looking to the most productive and economical use of steam as applied with either injectors or ejectors.

TRADE NOTES.

James L. Robertson & Sons, Inc., 48 Warren street, New York, have just put out a little card illustrating Eureka waterproof hydraulic packing, Eureka spiral packing and Eureka high pressure packing.

The Fox Machine Co., Grand Rapids, Mich., have just issued a catalog descriptive of their core box machine. The aim in producing the machine has been to reduce the cost of pattern making by greatly reducing the amount of time consumed in making core boxes.

Crown pneumatic hammers are described in detail in Bulletin 2010 of the Ingersoll-Rand Co. They are made in five sizes for chipping, calking, scaling, and flue beading, and in four sizes with a long stroke for driving rivets from the smallest size up to 1⅜-in. diameter. The bulletin also gives an interesting account of a displacement air meter by which the performance of these tools has been tested.

"More Holes for Less Money" is the title of a small folder recently issued by the Knecht Bros. Co., Cincinnati, O., devoted to the Knecht friction drive drill. This is an upright sensitive drill built in both belt and motor-driven patterns and has a friction-cone drive for rapidly varying the drilling speeds. It has a graduated scale on the latter to indicate the proper speeds for any drill up to its limit in capacity, 9-16 in.

The Northern Engineering Works, Detroit, has issued a booklet describing a great variety of types of electric and hand-operated cranes and hoists. Most of the illustrations show the apparatus in use. Electric traveling cranes ranging in capacity from 5 to 50 tons, air hoists and jacks, jib cranes of every type, locomotive cranes, clam-shell bucket, cranes and hoists for handling coal, sand and similar material, and overhead tracks and trolleys, are shown.

Buffalo forges are illustrated in a folder recently issued by the Buffalo Forge Co., Buffalo, N. Y., which calls special attention to the fact that the No. 200 Buffalo hand blower is now built with four legs and a clamp brace between them, together with a new style of head, fastening the blower to the stand, the whole enabling the outfit to be knocked down and easily packed for shipping. The No. 660 down-draft is now made with one length of cast-iron pipe, so that the entire outfit is practically all of cast-iron and should withstand the most severe service.

The Watson-Stillman Co., Havemeyer building, New York, have issued catalog No. 70 after a delay of many months in the printing establishment. Nearly one-half of the matter found in this catalog has never been shown by the company before and many sizes of tools have been added. The catalog is practically an assortment of sheets selected from over 800 pages of the company's printed matter, especially relating to hydraulic forcing presses which are those that are used for forcing fits or for driving broaching tools and similar work. In this respect the catalog is the most extensive which has yet been printed. It is not, however, complete with respect to tools for machine shop purposes.

Generated on 2024-08-28 14:00 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Fitting Out VESSELS

THAT'S OUR TRADE

WE supply everything that a vessel needs —and our guarantee goes with everything we sell.

Let us submit a bid for fitting out your ship this spring.

THE UPSON-WALTON CO.

CLEVELAND, O.

QUICK REPAIRS

on Crank Shafts, Stern Frames, Rudder Posts and other steel sections are made possible by the THERMIT PROCESS.

Thermit welds are not only quickly made but are STRONGER than the original piece owing to the fact that by our process a REINFORCEMENT of Thermit Steel is left around the weld.

Write for our new Pamphlet No. 18-E and learn of the many successful repairs that have been made by our process and of the saving in expense which has resulted from reduced time of ship in dry dock.

Goldschmidt Thermit Company

90 West St., NEW YORK

432-436 Folsom St.

SAN FRANCISCO

Geo. L. McCurdy

169 Jackson Boulevard

CHICAGO ILLINOIS

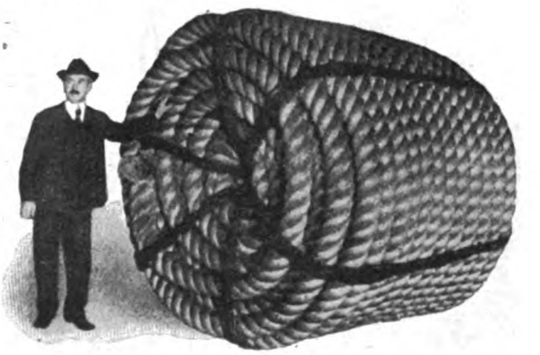
INSURANCE

HULLS and CARGOES

DIRECT REPRESENTATIVE OF LEADING AMERICAN AND FOREIGN UNDERWRITERS

Manila Rope That Wears

When buying rope for marine service quality should be considered first. A small cut on the price will not make up for **40 to 50% longer service** to be had from first-class Manila.



Let us submit samples. They will show the quality.

Buffalo Ship Chandlery & Supply Co.

11 & 13 MAIN ST., BUFFALO, N. Y.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Digitized by Google

Original from UNIVERSITY OF MICHIGAN

INDEX OF ADVERTISERS

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on page noted.
The dagger (†) indicates that advertisement appears once a month.

†Akers Steering Gear Co..... 14
Almy Water Tube Boiler Co.. 67
American Injector Co..... 13
American Line 78
American Sawdolet Co..... 79
American Ship Building Co... 4
American Ship Windlass Co.. 2
Armstrong Cork Co..... 84
*Armstrong Manufacturing Co. 71
†Ashton Valve Co..... 12
Atlantic Works 79
†Atlantic Works, Inc..... 11

Babcock & Penton..... 81
Baker, Howard H., & Co.... 84
Belcher, Fred P..... 80
Boland, J. J..... 80
*Boston & Lockport Block Co. 73
†Boucher Mfg. Co., The H. E. 9
Bowers, L. M., & Co..... 71
Breymann, G. H., & Bros..... 76
Briggs, Marvin 66
Brown & Co..... 80
†Brown Hoisting Machinery Co. 3
Buffalo Dredging Co..... 76
Buffalo Dry Dock Co..... 5
†Buffalo Ship Chandlery & Supply Co. 63
Bunker, E. A..... 71

Chase Machine Co..... 64
Chicago Ship Building Co.... 4
Cleveland & Buffalo Transit Co. 78
Cleveland City Forge & Iron Co. 83
*Collingwood Shipbuilding Co. 5
†Columbian Rope Co..... 16
Continental Iron Works..... 2
Cory, Chas., & Son..... 82
Cramp, Wm., & Sons, S. & E. B. Co..... 8
†Crescent Machine Co..... 11
Curr, Robert 81

Dake Engine Co..... 3
Dearborn Drug & Chemical Wks. 11
Delany, P., & Co..... 67
Delaware River Iron S. B. & E. Works 66
Detroit Ship Building Co..... 4
Dixon, Joseph, Crucible Co... 73
Donnelly Salvage & Wrecking Co. 79
Douglas, G. L., Jr..... 80
Drein, Thos., & Son..... 79
Dunbar & Sullivan Dredging Co. 76

Elphicke, C. W., & Co..... 80
*Emerson Shoe Co..... 17
†Empire Shipbuilding Co..... 73

Falls Hollow Staybolt Co..... 71
Fix's, S., Sons..... 82
Fletcher, W. & A., Co..... 79
Fogg, M. W..... 82
Fore River Ship Building Co.. 79
Furstenau, M. C..... 81

General Electric Co..... 84
Gilchrist, Albert J..... 80
†Goldschmidt Thermit Co..... 63
Goulder, Holding & Masten... 81
Great Lakes Dredge & Dock Co. 77
Great Lakes Engineering Wks. 18
Great Lakes Register..... 81
*Great Lakes Towing Co..... 65
Griscom-Spencer Co. 69

Hall, John B..... 80
Hanna, M. A., & Co..... 77
†Hardy & Dischinger Co..... —
Hawgood, W. A., & Co..... 80
Helm, D. T., & Co..... 80
Holmes, Samuel 80
Hoyt, Dustin & Kelley..... 80
Hunt, Robert W., & Co..... 81
Hutchinson & Co..... 80
Hyde Windlass Co..... 84

†Ideal Pump Governor Co.... 67
International Mercantile Marine Co. 78
Jenkins Brothers 84
Jenkins, Russell & Eichelberger 80
Johnson Bros. 67

Kahnweiler's Sons, David.... 83
Katzenstein, L., & Co..... 71
Kidd, Joseph 81
Kingsford Foundry & Machine Works 67
Kremer, C. E..... 80
*Le Mois Scientifique et Industrial 75
Levine, A. & Co..... 76

Lockwood Mfg. Co..... 82
Lorain Coal & Dock Co..... 77
Lundin, A. P..... 84
Lunkenheimer Co. 12

McCarthy, T. R..... 80
McCurdy, Geo. L..... 63
McKinnon Iron Works..... 71
MacDonald, Ray G..... 80
Mallory Line 78
*Marine Iron Co., Bay City, Mich. 76
Marine Iron Works..... 83
*Marine Mfg. & Supply Co.. 73
Marshall, Alexander 80
Martin-Barriss Co. 79
Maryland Steel Co..... 10
Maytham, Frank 80
Mehl, Edward 80
Milwaukee Dry Dock Co..... 5
Mitchell & Co..... 80
Morse, A. J., & Son..... 79

Nacey & Hynd..... 81
†New Bedford Boiler & Machine Co. 11
Newport News Ship Building & Dry Dock Co..... 6
New York Shipbuilding Co.... 7
†Nicholson Ship Log Co..... 2
Northern Dredge Co..... 77
Northwestern Steam Boiler & Mfg. Co. 67

O'Connor, J. J..... 80
†Oster Mfg. Co..... 73
Otis Steel Co..... 15

Parker Bros. Co..... 80
Penberthy Injector Co..... 13
Pickands, Mather & Co..... 77
Pittsburg Coal Co..... 65
Prindiville & Company..... 81

Quintard Iron Works Co..... 14

Red Star Line..... 78
Republic Belting & Supply Co.. 17
Richardson, W. C..... 80
*Ritchie, E. S., & Sons..... 76
Roberts Safety Water-Tube Boiler Co. 14
Roelker, H. B..... 82
†Rogers Steam Oil Separator Co. 69
Root, W. O..... 81
Ross Valve Co..... 82

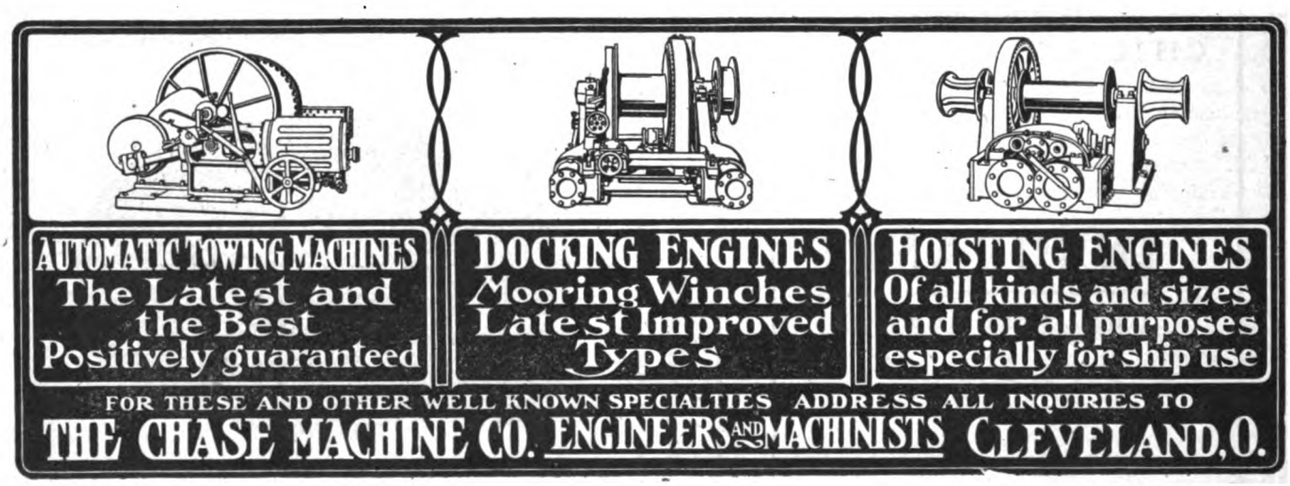
Safety Car Heating & Lighting Co. 3
Scherzer Rolling Lift Bridge Co. 9
Schrader's, A., Son, Inc..... 82
†Scoville Check Valve Co.... 71
†Seneca Chain Co..... 16
Shaw, Warren, Cady & Oakes 80
*Shelby Steel Tube Co..... 67
Sheriffs Mfg. Co..... 73
Shipping World Year Book... 82
Siggers & Siggers..... 81
Smith Coal & Dock Co., Stanley B. 65
Smooth-On Mfg. Co..... 83
†Spence Mfg. Co..... 15
Spencer, H. R..... 80
Standard Varnish Works..... 16
Starke, C. H., Dredge & Dock Co. 76
Steel Mill Packing Co..... 15
Stratford, Geo., Oakum Co.... 73
Submarine Signal Company.... 9
Sullivan, D., & Co..... 80
Sullivan, M. 77
†Superior Iron Works..... 65
Superior Ship Building Co.... 4

Tietjen & Lang Dry Dock Co. 84
*Toledo Fuel Co..... 77
Toledo Ship Building Co..... 5
†Toledo White Lead Co..... 71
Trout, H. G..... 73
Truscott Boat Mfg. Co. 15

Upson-Walton Co. 63
United States Graphite Co.... 12

Vance & Joys Co..... 80

Walker, Thomas, & Son..... 17
*Watson-Stillman Co. 83
†Wheeler Condenser & Engineering Co. 73
Willcox, Peck & Hughes..... 66
Wilby, Carlton 81
†Williams Gauge Co..... 13
Williams, D. T., Valve Co... 2
Wood, W. J..... 81
†Woodhouse Chain Works..... 16

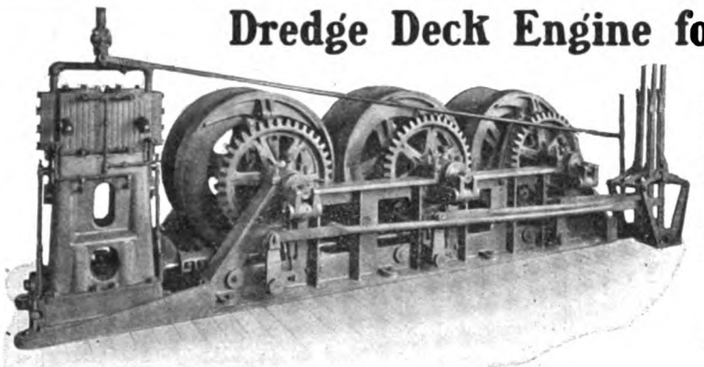

AUTOMATIC TOWING MACHINES
The Latest and the Best
Positively guaranteed
DOCKING ENGINES
Mooring Winches
Latest Improved Types
HOISTING ENGINES
Of all kinds and sizes and for all purposes especially for ship use
FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO
THE CHASE MACHINE CO. ENGINEERS AND MACHINISTS CLEVELAND, O.

"The up-to-date manufacturer of to-day realizes the importance and value of space in his trade papers and exercises good judgment in the preparation of his copy."—*Printers Ink.*

Our Ad Designing Department makes just this thing possible. All you have to do is to give us a suggestion and we put it into attractive shape.

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Dredge Deck Engine for Handling Dump Scows



Wire lines are used with this machine, instead of Manila, and we have the testimony of those using them, that they will **SAVE THEIR COST IN ONE SEASON.** Built in two sizes. (The cut shows small size.)

We also build **STEAM SCOW WINDERS** for raising the hopper doors by power. **WILL WIND UP A TENHOPPER SCOW IN TEN MINUTES.**

Write for circulars and particulars.

SUPERIOR IRON WORKS,
Superior, Wis.

G

Wrecking Steamer FAVORITE

Located at St. Ignace this Year.

The New Wrecking Steamer FAVORITE, Alex. Cunning, Master, will be stationed during season 1907 at ST. IGNACE, MICH. A Long-Distance Telephone will be installed on board the steamer. When at her home dock, the steamer can be reached by telephone any time day or night, 'Phone Number 63, and in absence of steamer full information as to the steamer may be obtained by telephoning to residence of Capt. Cunning, St. Ignace.

The Favorite is the most complete wrecking steamer in the world and is capable of going anywhere in all weathers.

Smith's Coal Dock

DETROIT RIVER
DETROIT, MICH.

12 Pockets. Platform.
Low Dock

Operated by
STANLEY B. SMITH & CO.

PITTSBURG COAL COMPANY

GENERAL OFFICE, LAKE DEPARTMENT, ROCKEFELLER BUILDING, CLEVELAND, OHIO

Steamboat Fueling Facilities at Various Points on the Great Lakes

CLEVELAND HARBOR { 4 Car Dumpers. 3 Lighters. } FAIRPORT HARBOR { 1 Car Dumper. 1 Lighter. } ERIE HARBOR { 1 Car Dumper. Fuel Lighter.

ASHTABULA HARBOR { 1 Car Dumper. 1 Lighter. } DETROIT RIVER BRANCH { Docks and Pockets at Sandwich and Amherstburg.

SAULT RIVER BRANCHES { Dock—Pittsburgh Landing. Dock and Pockets at Sault Ste. Marie. (The Port Royal Dock Co.)

WE FURNISH ONLY THE BEST GRADE

PITTSBURG AND YOUGHIOGHENY COAL

Generated on 2024-08-28 13:58 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

CLASSIFIED ADVERTISING SERVICE

PROPOSALS.

PROPOSALS FOR CONSTRUCTING breakwater. U. S. Engineer Office, 813 Prospect Ave. S. E., Cleveland, Ohio, August 10, 1907. Sealed proposals for extension of west breakwater at Fairport Harbor, Ohio, will be received at this office until 2 P. M. Standard Time, September 10, 1907, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. C. McD. Townsend, Lieut. Col., Corps of Engineers, U. S. A.

PROPOSALS FOR CONSTRUCTING breakwater. U. S. Engineer Office, 813 Prospect Ave. S. E., Cleveland, Ohio, August 10, 1907. Sealed proposals for extension of the east breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P. M. Standard Time, September 10, 1907, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. C. McD. Townsend, Lieut. Col., Corps of Engineers, U. S. A.

U. S. Engineer Office, Milwaukee, Wis., Aug. 2, 1907. Sealed proposals for removing old pier, building pile pier, dredging, etc., at Two Rivers Harbor, Wis., will be received here until 2 P. M. September 3, 1907, and then publicly opened. Information furnished on application. W. V. Judson, Major, Engrs.

U. S. Engineer Office, Jones Bldg., Detroit, Mich., August 26, 1907. Sealed proposals for rock and earth excavation, Section 2, Plan B., Detroit River, will be received here until 3 P. M., October 7, 1907, and then publicly opened. Information furnished on application. Chas. E. L. B. Davis, Col., Engrs.

COAL HANDLING MACHINE

ONE BROWN RAPID COAL Handling Machine for sale. Now in use at Toledo Docks. This Machine is in very fair shape and is to be replaced by one of larger capacity. Will be glad to furnish any information to interested parties.

C. B. Duffy, P. A.
Hocking Valley Ry.
Columbus, O.

DIVING OUTFIT FOR SALE

DIVING OUTFIT FOR SALE, IN First-class condition. Address The Cowing Engineering Co., 426 Citizens Bldg., Clevland, Ohio.

BOILERS FOR SALE

TWO MARINE BOILERS for sale, 15 ft. 10 in. diameter, 10 ft. 5 in. long; 4 corrugated furnaces each. Address the Griscom-Spencer Company, 90 West St., New York City.

PUMP FOR SALE

CENTRIFUGAL DREDGE PUMP for sale, No. 10 Van Wie make. Address The Cowing Engineering Co., 426 Citizens Bldg., Cleveland, Ohio.

ONE 100 H. P. ECONOMIC BOILER for sale, new flues, fine condition, also one 65 H. P. Erie City horizontal engine, fair condition. Cleveland MacAdam Company, Builders Exchange, Cleveland, Ohio.

STEAMERS FOR SALE.

THE LIGHTHOUSE STEAMER Haze, 145 ft. long, 27-ft. beam, 9-ft. draught, 500 tons capacity, 300 horsepower engine and boiler, suitable for passenger or freight business, fully equipped. Steam capstan, donkey boiler. Jacob Ullman, 46 Lloyd street, Buffalo, N. Y.

PASSENGER STEAMER GRANDON for sale, composite build 70 ft. long, 16½ ft. beam, compound engine, independent air pump. Boiler is new 1907, allowed 207 lbs. steam. Equipment is very complete. Also one lighter 100 tons capacity, built of oak, three years old. For information address Henry Freyensee, Sandusky, Ohio.

STEAMER V. SWAIN FOR SALE, coal capacity 1,200 tons. Now lying at Superior, Wisc.

Also Tow Barge Wm. McGregor, coal capacity 1,400 tons. For particulars, address J. E. Sheehan, 970 Fourth Ave., Detroit, Mich.

EXCURSION STEAMER FOR SALE VERY CHEAP, 87 ft. long, 18 ft. 6 in. beam, 7 ft. hold, draws 6 ft. 6 in. water. Engine compound 11½ x 20 x 16. Boiler 100 lbs. Electric lights and Search Light. Everything modern and in good condition. Allowed 215 passengers on route. Capt. F. R. McGregor, 424 Claremont ave., Chicago, Ill.

VESSEL BROKER.

TALK WITH BRADLEY.—Before buying or selling a boat. I have vessels of most every kind—from 10 tons to 6,000 tons—to sell for owners. Anybody wishing to buy or sell boats should call or write.

Fred A. Bradley,
247 Delaware Ave.,
Buffalo, N. Y.
Bell 'Phone, Tupper 5933.

TUGS FOR SALE.

TUG ENTERPRISE FOR SALE. 50 x 14; engine 10½ x 12; boiler 52" x 8'; 110 lb. steam pressure. 1 marine boiler, 100 H. P. 1 12 in. cent. pump and 30 ft. 12 in. hose. Chas. Dahlke, 208 Am. Trust Bldg., Cleveland.

TUG FOR SALE, 63 FT. 6 IN. O. A., beam, 15 ft., depth 7 ft. 6 in., gross tonnage 40, Scotch boiler 9 x 7.8. Rebuilt from keel up in fall of 1905, not in commission since November, 1906, speed 12 miles. Price $3,500. Must sell quick. A. B. Moulder, 608 Wetherbee Bldg., Detroit, Mich.

FOR SALE, MISCELLANEOUS.

NEAFIE & LEVY F & A COMpound 26"-50" x 30" with Surface Condenser and Pumps. Will alter to 22"-50" x 30" for high steam.

13½ K. W. Electric Lighting Set.

Williamson Steering Engine.

Two Hawser Pullers (Capstans).

Two Providence Steam Windlasses.

Wheeler Surface Condenser.

Blake Vertical Duplex Air Pump and Jet Condenser. 7½" steam, 16" air, 12" stroke.

Worthington Duplex Air Pump & Jet Condenser 9" x 12" x 10".

D. C. Sturtevant Blower & Engine.

Two Scotch Boilers 12' x 12'.

Two Scotch Boilers 11' x 12'.

Two Scotch boilers 13½' x 12'.

MARVIN BRIGGS, INC.,
154 Nassau Street, New York.

WILLCOX, PECK & HUGHES

SUCCESSORS

CHAS. E. & W. F. PECK

NEW YORK, No. 3 South William Street.

Average Adjusters. Insurance Brokers.

BUFFALO CLEVELAND CHICAGO
MINNEAPOLIS SEATTLE NEW ORLEANS

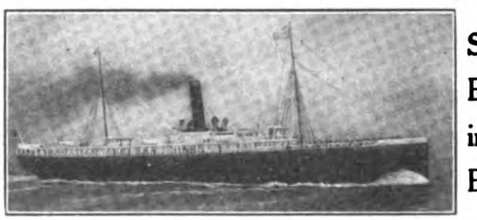
REPRESENTED BY
C. T. BOWRING & CO., (Insurance) Ltd.,
5 and 6 Billiter Ave., LONDON,
and at "LLOYD'S" LONDON.

HULLS AND CARGOES.

We place insurances in the most advantageous markets, having unequaled facilities for procuring, in the interests of our clients, the best obtainable rates and terms from the strongest Foreign and Home companies.

We Represent the Assured

ROACH'S SHIP YARD.



Ship Building in all its Branches

BUILDERS OF
STEAMSHIP AND MARINE MACHINERY.
Delaware River Iron Ship Building & Engine Works
CHESTER, PA.

Generated on 2024-08-28 14:03 GMT / https://hdl.handle.net/2027/mdp.39015043584443
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN